US PATENT & TRADEMARK OFFICE
3 0402 00119 3509

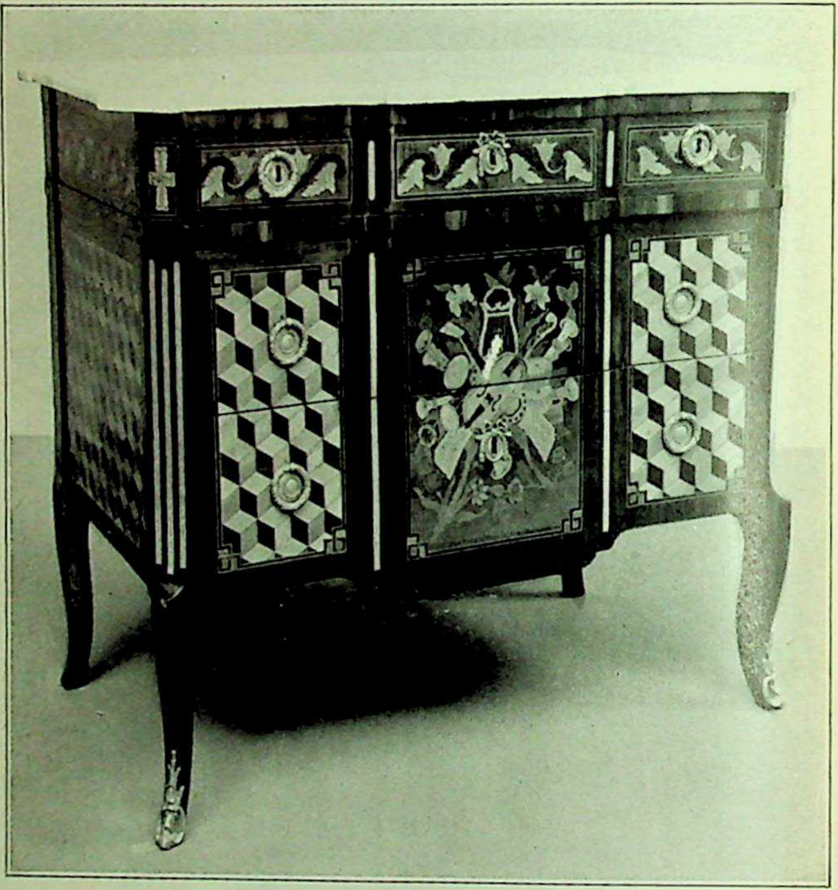
SCIENTIFIC AND TECHNICAL

U.S. DEPARTMENT OF COMMERCE • PATENT & TRADEMARK OFFICE •

INFORMATION CENTER

# FURNITURE

## Furniture Finishing
## Decoration and
## Patching



A Louis XVI Marble-top Commode, Showing Exceptionally Beautiful Inlay and Marquetry Work.

# FURNITURE
# Furniture Finishing
# Decoration and Patching

In Five Parts

I—PERIOD FURNITURE AND MODERN STYLES
II—FURNITURE FINISHING
III—FURNITURE DECORATION
IV—FURNITURE PATCHING
V—SPECIAL FINISHES—LAMPS, MIRRORS, PIANOS, RADIO CABINETS, ETC., ETC.

A New and Complete Work on Furniture of All Kinds, With Full Practical Instruction on Finishing, Patching and Decoration—Materials, Tools and Processes.

By

**ALBERT BRACE PATTOU**
and
**CLARENCE LEE VAUGHN**

*FULLY ILLUSTRATED*

CHICAGO
FREDERICK J. DRAKE & CO.
PUBLISHERS

IBRAR
JUN 30 1927
U. S. PATENT OFF

TS
880
.P3

COPYRIGHT 1927
BY
FREDERICK J. DRAKE & COMPANY ✓
CHICAGO

*Printed in the United States of America*

MAY 31 '27
© Cl A990299

# PREFACE

In a work of so broad a scope, the authors wish us to say, first of all, that no attempt has been made to exhaust the subject—such a task would require at least ten volumes the size of this one. In the matter of processes of finishing, patching and decorating furniture, there are many different minds and different practices, and not all by any means are agreed as to the best ideas and the best methods of executing them. The chief aim, therefore, has been in all cases to give up-to-date and proved practical instruction as to materials and processes.

For many years the publishers, with their extensive patronage for their books along the line of painting, decorating, home furnishing and wood finishing, have had almost countless requests for a book of this kind. The great difficulty has been to find anyone with the knowledge and practical experience who could and would write it. We feel highly elated therefore, in our successful efforts in inducing Messrs. Pattou and Vaughn to undertake the work. Their training and experience have been such that, we believe the results of their work are entitled to the confidence of all who are interested in this subject.

Mr. Albert Brace Pattou, of the Adams and Elting Co., Chicago, has written extensively for the past six years on furniture finishing methods, the articles appearing in various trade journals. In Book I Mr. Pattou presents the results of his pursuit of a hobby, the study of furniture of all times, and in Books III and V he presents his knowledge gained from diversified service work rendered by his company's practical staff.

Mr. Clarence Lee Vaughn, of Chicago, has been interested for fifteen years in the manufacture and distribution of furniture finishing and patching materials. For several years he has been conducting in Chicago a school of furniture finishing and patching, and is therefore familiar not only with the materials, but with practical methods of applying them. Mr. Vaughn has prepared the subject matter in Book II, on Furniture Finishing, Book IV, on Furniture Patching, and a few of the special finishes in Book V.

We take this opportunity to express the indebtedness of both the authors and publishers to the following individuals and concerns who have aided in the production of this work.

First of all, to Mr. F. N. Vanderwalker for the use of several excellent illustrations from his highly successful books on Painting, Wood Finishing, Wall Decoration, Stencils, etc.

To *The American Painter and Decorator*, of St. Louis, for permission to reprint parts of articles by Mr. Pattou, which have appeared in that excellent journal in past years.

To the Metropolitan Museum of Art, New York, and The Art Institute, Chicago, for the illustrations shown in Book I.

We are specially indebted to the following concerns:

Mr. Samuel D. Rowe, of the Veneer Manufacturing Company, Chicago
The DeVilbiss Company, of Toledo, Ohio
Gerts, Lumbard & Company, Chicago
Ballman-Cummings Furniture Co., Fort Smith, Ark.
Mitchell & Mitchell, Fort Smith, Ark.
Knapp & Tubbs, Chicago, Ill.
Empire Case Goods Co., Jamestown, N. Y.
Behnke-Fink Co., Chicago, Ill.
The Weiman Co., Chicago, Ill.
S. Karpen Bros., Chicago, Ill.
Bemis Mfg. Co., Sheboygan Falls, Wis.
Union Furniture Co., Jamestown, N. Y.
Lomira Mfg. Co., Lomira, Wis.
Ypsilanti Reed Furniture Co., Ypsilanti, Michigan
Kernes Mfg. Co., Chicago, Ill.
General Fireproofing Co., Youngstown, Ohio
Richardson Bros., Sheboygan Falls, Wis.
Northern Furniture Co., Sheboygan, Wis.
Brazil Wood Products Co., Brazil, Ind.
American Emblem Co., Utica, N. Y.
C. A. Kitz Furniture Co., Milwaukee, Wis.
The Lane Co. Altavista, Va.
Standard Screen Co., Chicago, Ill.
Unagusta Mfg. Co., Hazelwood, N. C.
Peabody School Furniture Co., No. Manchester, Ind.
Cable-Nelson Piano Co., South Haven, Michigan
De Kalb Mfg. Co., Auburn, Ind.
Zenith Radio Corp., Chicago, Ill.
Gurney Refrigerator Co., Fond du Lac, Wis.
D. H. Fritts & Co., Chicago, Ill.
The Dover Mfg. Co., New York, N. Y.
Hansen Furniture Co., Chicago, Ill.
Standard Chair Company, Thomasville, N. C.
Hilo Varnish Co., Newark, N. J.
Coons Mfg. Co., Abingdon, Ill.
Pickrell Veneer Co., Louisville, Ky.
Troy Sunshade Co., Troy, N. Y.
Block-Portelier Co., Chicago, Ill.
Hastings Table Co., Hastings, Mich.

THE PUBLISHERS.

LIBRARY
15237
JUN 30 1927
U. S. PATENT OFFICE

# CONTENTS

## BOOK I
## PERIOD FURNITURE AND MODERN STYLES

Chapter Page
I. Egyptian—Assyrian (2000-500 B. C.) ........ 21
II. Graeco-Roman (Classical Period, 500 B. C.—500 A. D.) 26
III. Gothic (The Middle Ages, 1200-1443) ........ 30
IV. Italian Renaissance (Classic Revival, 1450-1650) ... 35
V. Spanish Renaissance (1500-1700) ........ 41
VI. Tudor and Elizabethan (The English Renaissance, 1485-1603) ........ 47
VII. Jacobean (The Stuart-Cromwellian-Restoration Era, 1603-1689) ........ 52
VIII. William and Mary (First Dutch Influence, 1689-1702) 58
IX. Queen Anne (Dutch Influence at Height, 1702-1750) 63
X. Chippendale (1750-1830) ........ 68
XI. Hepplewhite (1750-1830) ........ 73
XII. The Adam Brothers (1750-1830) ........ 77
XIII. Sheraton (1750-1830) ........ 82
XIV. Louis XIV (The Regal Period, 1643-1715) ........ 87
XV. Louis XV (The Rococo Period, 1723-1774) ........ 91
XVI. Louis XVI (The Classic Revival, 1774-1793) ........ 96
XVII. French Empire (1799-1814) ........100
XVIII. American Colonial (1620-1810) ........105
XIX. Duncan Phyffe and American Empire (1795-1840)..111
XX. Victorian and Mission (1840-1900) ........115

## BOOK II
## FURNITURE FINISHING

I. Brief History of Furniture Finishing ........121
II. Woods ........126
III. The Finishing Room, Equipment, Materials, Colors..144
IV. Stains ........159
V. Filler ........174
VI. Choice of First Coaters ........182
VII. Second Coat—Materials—Selection ........199
VIII. Finishing Coats ........212
IX. Removing Varnish and Refinishing ........223

## BOOK III
## FURNITURE DECORATION

I. Furniture Decoration ........235
II. Glazing and Shading Painted Work ........245
III. Antique Dusting ........252
IV. Stipple Glazing and Venetian Work ........256
V. Two-Toning ........264
VI. Carvings and Mouldings ........268
VII. Inlay and Marquetry ........274
VIII. Overlays, Frets and Grilles ........279
IX. Matched Veneers ........285
X. Banding, Striping and Vein Lining ........293

XI. Polychrome .....300
XII. Crackling .....306
XIII. Frosting .....309
XIV. Spattering and Veiling .....314
XV. Raised Stippling and Gesso .....320
XVI. Stencils and Stenciling .....328
XVII. Decalcomania Transfers .....338
XVIII. Free-hand Painting .....345
XIX. Oriental Lacquering .....350
XX. Metal Leaf, Bronze and Metallic Imitations .....358

## BOOK IV
## FURNITURE PATCHING

I. The Art of Patching .....369
II. The Patch-Work Kit .....375
III. Removing Packing Marks .....388
IV. Patching Scratches .....398
V. Indentations and Rubbed Through Places .....413
VI. How to Remove Water Marks on Finish .....421
VII. Repairing Enamel and Pigment Lacquer .....427
VIII. Patching Special Finishes .....435

## BOOK V
## SPECIAL FINISHES

I. Turned Objects: Candle Sticks, Lamp Bases and Smoker Stands .....443
II. Lamp Shades .....446
III. Metal Lamp Stands .....448
IV. Cedar Chests .....450
V. Refrigerators and Kitchen Cabinets .....454
VI. Wicker Furniture .....459
VII. Radio Cabinets .....464
VIII. Breakfast Room Furniture .....470
IX. Grained Metal Furniture .....475
X. Enameled Metal Furniture .....480
XI. Art Metal Furniture .....484
XII. Novelty Furniture .....488
XIII. Upholstered Furniture .....493
XIV. Enameled Wood Furniture .....496
XV. School Furniture .....501
XVI. Outdoor Furniture .....504
XVII. Office Furniture .....509
XVIII. Chairs .....511
XIX. Drawers and Interiors .....514
XX. Picture Frames .....518
XXI. Crystalizing .....520
XXII. Mirror Resilvering .....524
XXIII. Cane Glazing .....526
XXIV. Piano Finishing Methods .....528
XXV. Imitation Burl Walnut on Gum Wood .....535
XXVI. Batik on Wood, Gesso, Gilding, Polychrome .....536
Index .....539

# ILLUSTRATIONS

Frontispiece.—A Louis XVI Marble-top Commode.

## BOOK I

Plate Page
I. 1. Egyptian Carved Chair. 2. Modern Table, Egyptian in Design and Decoration. 3. Egyptian Painted Casket (Restored) 23
II. 1. Egyptian Stool. 2. Egyptian Table. 3. Egyptian Wooden Stool with Rush Top. 4. Egyptian Head Rest. 5. Limestone Relief from the Tomb of an Egyptian Lady 24
III. 1. Roman Table, Inlaid. 2. Roman Tripod Torchere. 3. Roman Bronze Stool. 4. Roman Couch 27
IV. 1. A Gothic Chest. 2. Gothic Chest 31
V. 1. Gothic Cabinet. 2. Gothic Cupboard. 3. Gothic Armoire. 4. Gothic Cupboard 32
VI. 1. Italian Renaissance Side Chair. 2. Spanish Renaissance Chair. 3. Dante or Savonarola Carved-X Italian Renaissance Chair. 4. Modern Reproduction of Roman or Dante Folding Chair in Walnut 36
VII. 1. Italian Renaissance Carved Chair. 2. Italian Renaissance Velvet Upholstered Chair. 3. Italian Renaissance Carved "Cassapanca." 4. French Renaissance Long Table 38
VIII. 1. Italian Renaissance Sideboard or "Credenza." 2. Renaissance German Cupboard 39
IX. Spanish Vargueño, Showing Inlay in Moorish Spirit 42
X. 1. A Spanish Bench. 2. Spanish Long Table 43
XI. Spanish Vargueño 45
XII. 1. Tudor Wainscot Chair in Oak. 2. Elizabethan Court Cupboard 48
XIII. 1. Tudor Stool, Showing Medallion Profile Carving. 2. Triangular Chair. 3. Elizabethan Melon-bulb Draw-top Refectory Table. 4. Tudor Wainscot Chair. 5. Glastonbury Folding Chair 49
XIV. 1. Restoration Chair, Showing Crown and Tulip Carving. 2. Restoration Cane-back Armchair. 3. Jacobean Turned and Carved Stretcher Stool. 4. Jacobean Stretcher Stool. 5. Jacobean Desk-box 53
XV. 1. Jacobean Court Cupboard. 2. Cromwellian Wing Chair. 3. Jacobean Cupboard 54
XVI. Oak Chest of Jacobean Period 56

XVII. 1. William and Mary Side Chair. 2. William and Mary Trumpet-leg Highboy. 3. Double-hood William and Mary Secretary. 4. William and Mary Cane Back Chair ........................................ 59
XVIII. 1. Elaborate William and Mary Cabinet. 2. Six-legged William and Mary Cabinet. 3. William and Mary Side Table. 4. William and Mary Chest ................ 61
XIX. 1. Queen Anne Side Chair. 2. Queen Anne Desk. 3. Queen Anne Cupboard. 4. Queen Anne Arm Chair 64
XX. 1. Queen Anne Side Chair in Walnut with Fancy Veneer Splat. 2. Queen Anne Needlework Stool. 3. Queen Anne Humpbacked Settee ........................ 66
XXI. 1. Chippendale Upholstered Armchair. 2. Chippendale Ribband-back Chair. 3. Chippendale Drop-leaf Side Table, Chinese Style ............................ 69
XXII. 1. Chippendale Tilt-top Piecrust Table. 2. Chippendale Secretary. 3. Chippendale Scroll-foot Chair. 4. Chippendale Armchair, Gothic Style .................. 71
XXIII. 1. Hepplewhite Inlaid Card Table. 2. Hepplewhite "Tambour" Desk. 3. Hepplewhite Upholstered Window Side Seat. 4. Hepplewhite Side-chair .......... 74
XXIV. 1. One of a Nest of Tables, Adam Style. 2. Adam Bookcase. 3. Adam Sideboard Knife Urn of Classical Design. 4. Adam Cane Seat Armchair ............. 78
XXV. 1. Adam Serpentine Front Console Table. 2. Adam Eight-legged Daybed. 3. Adam Sideboard .......... 80
XXVI. 1. Sheraton Adjustable Dressing Glass. 2. Shearer Inlaid Cabinet. 3. Sheraton Upholstered Armchair. 4. Sheraton Inlaid Card Table .................. 83
XXVII. 1. Sheraton Folding Washstand. 2. Sheraton Gentleman's Dressing Table ............................ 85
XXVIII. 1. Louis XIV Armchair. 2. Louis XIV Tapestry Armchair. 3. Louis XIV Cabinet-desk. 4. Louis XIV Carved Armoire ................................ 88
XXIX. Louis XIV Gilded Side Table ...................... 90
XXX. 1. Louis XV Marble-top Rococo Console. 2. Louis XV Carved Table. 3. Louis XV Painted Armchair, Upholstered. 4. Regency Transition Armchair. 5. Louis XV Gilded Console ............................. 92
XXXI. 1. Louis XV Marquetry Boudoir Desk. 2. Louis XV Cane-back Side Chair. 3. Louis XV Wing "Bergère." 4. Louis XV Marble-top Table .................... 94
XXXII. 1. Louis XVI Marble-top Side Table. 2. Louis XVI Upholstered Armchair. 3. Louis XVI Cylinder Desk .. 97
XXXIII. 1. Louis XVI Oval Back Upholstered Side Chair. 2. Louis XVI Bedstead ......................... 99
XXXIV. 1. Empire Bedstead. 2. Empire Dressing Table. 3. Empire Cheval Glass .........................101
XXXV. 1. Empire Armchair. 2. Empire Side Chair. 3. Empire Marble-top Side Table. 4. Empire Console Table ....103

XXXVI. 1. Colonial Sheraton Mahogany Sideboard, Inlaid. 2. Colonial Mahogany Lowboy. 3. Splat-back, Rush-bottomed Chair ....106
XXXVII. 1. Early Colonial Carved Chest (Oak). 2. Colonial Gate-leg Table (Cherry). 3. Colonial Chippendale Ladder-back Chair (Mahogany). 4. Colonial "Bombe" Cabinet Desk (Walnut). 5. Colonial Mahogany Pier Table ....108
XXXVIII. 1. Dutch Colonial "Kas" or Cupboard. 2. Colonial Dressing Table (Walnut). 3. Early Colonial Butterfly Table (Maple). 4. Pennsylvania German Chest ..110
XXXIX. 1. Duncan Phyffe Drop-leaf Colonnade Table. 2. Duncan Phyffe Lyre-back Side Chair. 3. Duncan Phyffe Long Table ....112
XL. American Empire Sideboard ....114
XLI. 1. Victorian Whatnot. 2. Victorian Side Chair. 3. Victorian Sofa ....116
XLII. Mission Sideboard and Table of Oak ....118

## BOOK II

I. The Walls, Floors, Ceilings and Furniture of These Rooms Were Finished With Lacquer....120
II. Curly Birch ....128
III. Birch, Straight-Sawed ....128
IV. Cherry Burl ....130
V. English Elm Burl ....131
VI. Ash Burl ....132
VII. Mexican Mahogany (Broken Stripe) ....134
VIII. Quarter-Sawed Oak ....137
IX. Plain-Sawed Oak ....136
X. Pollard Oak ....136
XI. 1. Birdseye Maple. 2. Curly Maple ....137
XII. 1. Walnut, Straight Grain. 2. Walnut Butt ....139
XIII. Rosewood ....140
XIV. Satinwood ....140
XV. Swiss Pear Tree ....141
XVI. English Pear Tree ....141
XVII. Magnolia Burl ....142
XVIII. Snakewood ....142
XIX. Bullet Wood ....143
XX. Koa Wood ....143
XXI. Layout of Spraying Equipment in a Production Establishment ....145
XXII. Complete Spray Equipment Except Air Compressor ...146
XXIII. Spray Gun with One-Finger Trigger ....147
XXIV. Spray Gun with Cup Attached ....148
XXV. Paint Storage Tank ....149
XXVI. A Portable Spraying Outfit ....150
XXVII. Pneumatic Rubbing and Sanding Machines. 1. With Sandpaper Attachments. 2. With Felt Pads ....151

XXVIII. Spraying Stain ....................................160
XXIX. Application of Filler ....................................178
XXX. Wiping of Filler with Excelsior or Wood Wool .......180
XXXI. Spraying First Coaters—Shellac or Lacquer—Also Second Coat—Lacquer or Varnish ....................186
XXXII. Spraying Enamel Undercoating or Lacquer Enamel...187
XXXIII. Showing Correct Position in Brushing any Material ...189
XXXIV. Downward Storke on Perpendicular Surface .........190
XXXV. Shellac Brush ....................................191
XXXVI. Belt Sanders Can Be Used on Flat or Moulded Surfaces ....................................195
XXXVII. Hand Sanding with Cork Block on Flat Surface .....197
XXXVIII. Spraying Lacquer ....................................200
XXXIX. Showing How Dining Room Sets Are Put Through Finishing Room Together to Insure Uniform Results..202
XL. Varnish Brush ....................................208
XLI. Using Pressed Felt Pad in Rubbing ..................214
XLII. Using Burlap for Rubbing Turned Surfaces .........220
XLIII. Spraying Wicker Furniture with Colored Lacquer .....222

BOOK III

I. Walnut and Gum, Spray-Shaded Armchair, Stained Directly on Wood ....................................236
II. Method of Shading Night Table, Gum Frame and Maple Top, with Lacquer Spray-Shading Stain over Filler ....................................236
III. Walnut and Gum Bedstead, Shaded Over Filler with Spirit Shading Stain ....................................238
IV. Water Stain Shading Direct on Walnut Veneer ........240
V. Enameled Dresser, Showing Spray-Shading with Lacquer Stain Followed by Rubbed Varnish ........246
VI. Hand Antique-Glazed Painted Bookcase ...............246
VII. Magazine Carrier, Both Finished and Shaded with Lacquer Enamel ....................................248
VIII. Smoking Set in Flat Paint Undercoater, Japan Color Shading Decalcomania Floral Transfer and Flat Varnish ....................................248
IX. Horizontal Stripes of Glazing Color for a Graduated Blend ....................................249
X. The Graduated Blend Finished .........................250
XI. Smoking Stand, Showing Antique Dusting ............253
XII. Antique Reproduction, Showing Use of Dusting on Oak to Produce Aged Effect ..........................254
XIII. The Stippling Brush and How It Is Used ............257
XIV. Spots of First Color and the Beginning of a Cheese-Cloth Stipple for Tiffany Glazing, Mottling and Blending ....................................258
XV. Glazing Color Blended Out with a Stippling Brush ...259
XVI. Glazing Color Stippled with a Wad of Newspaper ....260
XVII. Example of Flat Stipple Glazing with Banding on Legs and Table Edge ....................................261

XVIII. Venetian Commode, Showing Glazing and Hand-Painted Decorations ....262
XIX. Two-Tone Enamel, Green and Amber, with Shading and Half-Round Moulding Decoration ....265
XX. Two-Tone Walnut Humidor with Gold-Bronzed Vein Lines ....266
XXI. Hand-Carved Walnut Renaissance Table, with Marble Top ....269
XXII. Buffet, Showing Crotch Mahogany Veneers ....269
XXIII. Example of Hand-Carved Seat ....270
XXIV. Examples of Composition Furniture Mouldings ....271
XXV. Examples of Composition Carving ....272
XXVI. Border Inlay on Four-Way Mitred Butt Walnut Octagonal Table Top ....274
XXVII. Pollard Oak Sunburst Veneer Table Top ....275
XXVIII. Sections of Inlay, Showing Typical Border Designs...276
XXIX. Conventional Inlay Pattern ....277
XXX. Conventional Marquetry Inlay Pattern ....277
XXXI. Scroll Mahogany Overlay on Walnut Background, Shaded ....280
XXXII. Satinwood Overlay on Walnut Humidor with Inlaid Band ....281
XXXIII. Walnut and Mahogany Sideboard Showing Ebony Overlay ....282
XXXIV. Walnut China Closet, Showing Shaded Grille at Center.283
XXXV. Shaded Vanity Case, Showing Scroll Fretwork on Drawer Fronts ....284
XXXVI. Four-Way Matched Walnut Burl Veneer....286
XXXVII. Matched Diamond Rosewood Table Top....287
XXXVIII. Inlaid Table Top of Two-Way Butt Walnut Veneer....288
XXXIX. Highboy, Showing Shaded Blister Maple Veneer......289
XL. Block Roller Graining to Imitate California Redwood Burl on Table Center....291
XLI. Server From a Breakfast Suite....294
XLII. Example of Fancy Striping over Shaded Satinwood Panels ....295
XLIII. Vein Lining ....298
XLIV. Black Lining on Yellow Crackle....299
XLV. Examples of Carved Bases for Polychroming....301
XLVI. Spots of Several Colors as Put on to Begin a Multi-Color Blend ....303
XLVII. The Multi-Color Blend Finished....304
XLVIII. Priscilla Cabinet, Showing Green Crackle Over Black Lacquer with a Transfer Decoration....307
XLIX. Flat Frosting with White Filler Over Dark Gray Water Stain on Table Legs....310
L. Gray Painted Wicker Chair Frosted in Dark Blue.....311
LI. Walnut Buffet, Showing High Lighted End Overlays and Sand-Blasted Marquetry Effect on Center Drawers ....312

LII. A Spatter Finish Produced with a Spray Gun.........315
LIII. A Spatter Finish in Four Colors Done by Hand.......316
LIV. The Method of Holding and Using the Brush for Spatter Finishes ..................................318
LV. Modeled Gesso on Table Top..........................321
LVI. A Beautiful Decorative Finish.......................323
LVII. A Finer Texture, Produced by Spraying Lacquer Stipple Paste ....................................324
LVIII. A Very Fine-Grained Stipple Texture.................326
LIX. Hall Table, Showing Three-Color Stencil Filled in and Shaded by Hand..........................329
LX. One-Color Metal Stencil on Chair Back................330
LXI. Silk Screen Stencil on Chair Back, One Color.........331
LXII. Stenciled Cabinet....................................332
LXIII. A Roman Stencil Design..............................335
LXIV. An Egyptian Stencil Design...........................335
LXV. A Gothic Stencil Design..............................335
LXVI. "Ties" Correctly and Incorrectly Placed..............336
LXVII. One-Color and Background Stencils....................337
LXVIII. Color Stencils for Two-Color Work....................337
LXIX. Large Decalcomania in Chinese Pattern................339
LXX. Juvenile Piece Showing Transfer Decoration..........341
LXXI. Floral Transfers on Enameled Body....................342
LXXII. Free-Hand Painted Border Design on Table Top.......346
LXXIII. Pricked Outline of Hand Painting.....................348
LXXIV. Tracing of Design to be Applied to Furniture by Means of Carbon Paper..................................348
LXXV. Free Hand Painted Louis XVI Chest of Drawers.......349
LXXVI. Oriental Lacquered Secretary.........................351
LXXVII. Console Table of Modern Design Showing Oriental Decoration ....................................352
LXXVIII. Wall Cabinet of Chinese Design Decorated in the Oriental Manner...................................354
LXXIX. Walnut Server, Showing Gold-Bronzed Flat Carvings..359
LXXX. Spraying Gold-Bronzed Lacquer on Gesso Lamp Bases..362

## BOOK IV

I. A Spray Patching Outfit.............................372
II. Furniture Complaint Kit for Patching.................376
III. Knife, Lamp and Stick Filler.........................380
IV. A Rubber for French Polishing........................383
V. A Rubbing Brush for Dulling Inaccessible Surfaces....385
VI. A Dulling Brush Designed for Table Tops.............385
VII. A Penciling Brush Used for Touching Up Inconspicuous Spots ......................................386
VIII. Swan Quills, Used for Touching Up and Also for Striping ....................................386
IX. Dagger Stripers......................................386
X. A Wide Lining Brush for Filling in Wide Stripes and Other Work in Patching.............................387

XI. Application of Material to the Rubbing Pad for French Polishing .......... 390
XII. French Polishing .......... 391
XIII. Showing Rainbow Strokes and Straight Strokes .......... 392
XIV. A Hand-Power Spray for Coating Small Surfaces .......... 393
XV. A Small Mouth Spray Used in Patching Small Abrasions .......... 401
XVI. Holding the Knife in Right Hand and Cement in Left .. 405
XVII. Spreading the Cement with the Knife After Filling Scratches .......... 406
XVIII. Staining a Spot by Applying Stain to a Soft Frenched Surface and Dissolving by Passing Over Lightly with a Tacky Rubber .......... 410
XIX. (A) Test Tubes for Testing Pigment Color for Tinting Enamel; (B) Graduate Glasses; (C) Glass Jar; (D) Wood Chips for Testing Color .......... 430
XX. Penciling in Damage on Colored Lacquer or Enamel with Brush .......... 432

## BOOK V

I. Turned Smoking Stand, Painted, Shaded and Varnished . 444
II. Turned Smoking Stand, Stained and Varnished .......... 444
III. Beaded Cloth Shade, Hand-Painted .......... 447
IV. Lacquer Enameled Metal Lamp Stand .......... 449
V. Metal Lamp Stand .......... 449
VI. Cedar Chest in Natural Finish .......... 451
VII. Cedar Chest with Walnut Veneer Exterior .......... 452
VIII. Birdseye Maple Veneered Cedar Chest .......... 453
IX. Refrigerator Finished with Lacquer Enamel .......... 455
X. Willow Chair in Four-Color Pattern Effect .......... 460
XI. Fibre Reed Chair, Showing Banding, Shading and Pattern Decoration .......... 460
XII. Spraying a Willow Chair with Tinted Paint Undercoater .......... 462
XIII. Radio Cabinet in Natural Walnut .......... 464
XIV. Radio Cabinet Combining Decorative Processes of Oriental Lacquering, Fret Work, Matched Veneers, Shading, Carving, Hand Painting and Bronzing .......... 465
XV. Spanish Renaissance Style Radio Cabinet of Walnut ... 466
XVI. Radio Cabinet in Two-Tone Walnut Finish .......... 467
XVII. Breakfast Room Set of Green Enamel .......... 472
XVIII. Metal Bed One Coat Each—Ground, Graining and Flat Baking Varnish .......... 476
XIX. Block Graining by Machine-Operated Roller .......... 478
XX. Metal Tube Bed .......... 481
XXI. Wrought Iron Table, Marble Top .......... 485
XXII. Wrought Iron Aquarium with Verde Copper Finish .... 485
XXIII. Bronze Coffee Table, Marble Top .......... 486
XXIV. Fernery in Light Green Lacquer Enamel .......... 489
XXV. Folding End Table of Black Lacquer Enamel .......... 489

XXVI. Telephone Set in Flat Undercoater Shaded with Lacquer Stain ....................490
XXVII. Magazine Carrier in Lacquer Enamel....................491
XXVIII. Magazine Rack and Book Holder....................491
XXIX. Gum End Table in Brown Mahogany Oil Stain and Flat Varnish Finish....................492
XXX. Hand-Carved Upholstered Chair....................494
XXXI. Hand-Carved Mahogany Chair....................495
XXXII. Paint Undercoater and Rubbed Enamel Bedstead......497
XXXIII. Tilt-Top Table Finished with One Coat Flat Paint Undercoater, Spirit Shading Stain, Floral Transfer and One Coat Flat Varnish....................498
XXXIV. Juvenile Dresser, One Coat Ivory Undercoater and Gloss Enamel ....................499
XXXV. Bookstand, Showing Two Coats Lacquer Enamel and Lacquer Shading....................499
XXXVI. School Desk and Seat of Maple....................502
XXXVII. Assembly Room Seats of Birch....................502
XXXVIII. Auditorium Seat of Birch....................503
XXXIX. Garden Set of Cypress in White Long Oil Enamel.....505
XL. Maple Rocker with Cane Seat....................506
XLI. Cast Iron Table....................507
XLII. Metal Chairs....................507
XLIII. Wooden Lawn Bench, Painted Green....................508
XLIV. Oak Lawn Swing....................508
XLV. Office Desk of Oak....................510
XLVI. Office Armchair of Solid Mahogany....................510
XLVII. Oil Enameled Bedroom Chair....................512
XLVIII. Utility Chair of Birch....................512
XLIX. Dining Room Upholstered Side Chair....................513
L. Chifferobe Interior of Cedar....................515
LI. Radio Horn and Cabinet Panel Finished in Crystallizing Lacquer ....................521
LII. To be Stippled in on Zinc Etching of Vanity Case, Front of Radio Cabinet and Horn....................521
LIII. Vanity Case and Novelty Objects Decorated in Crystallized Finish....................522
LIV. Mahogany Grand Piano, Shaded and Finished in One Coat Gloss and One Coat Flat Lacquer....................529
LV. Varnish Checks Removed by Amalgamative Process—One-half of Finish Restored and Made Up-to-Date by Replacing Leg and Pilaster....................532

# BOOK I

## Period Furniture and Modern Styles

LIBRARY
15237
JUN 30 1927
U. S. PATENT OFFICE

# BOOK I

## CHAPTER I

### EGYPTIAN—ASSYRIAN

(THE DAWN OF HISTORY, 2000-500 B. C.)

IT WAS in the valley of the Nile, the cradle of civilization, that archeologists discovered, both from excavated relics and mural reliefs showing artisans actually at work, that Egyptians in the dawn of history were the first to make furniture as we understand it today. With tools we would regard as hopelessly primitive, they practiced the arts of joining, carving, inlaying, veneering and painting, attaining a soundness of construction (as witness the bracing on the table illustrated) that remains a model down to the present age.

Since they were lacking similar burial customs and the same preservative climate, much less has been brought to light regarding the furniture of Assyria, Babylon and Persia, despite their known high level of culture. The artisans of Assyria were skilled metal workers and were also familiar with teak, walnut, cedar and ebony, but the meagre information left us is chiefly from bas relief carvings in stone. It is in these that we find constantly recurring the characteristic lion's paw, pine cone and bull's hoof in chair feet, horses for chair sides and the ram's head at arm ends.

Squatted on his haunches, we see the early Egyptian joiner doweling and mortising, the upholsterer lacing leather to chair-seat frames and the cabinet maker coating solid woods of the commoner sort with hot glue to receive the veneer, laying it with heavy flat stones in place of cauls. The results of their labors appear in a variety of stools, beds, couches and caskets. The former were provided with rope or rush seats or on richer styles hollowed out to receive cushions, or partially padded and covered, either with loose animal skins or colorful textiles.

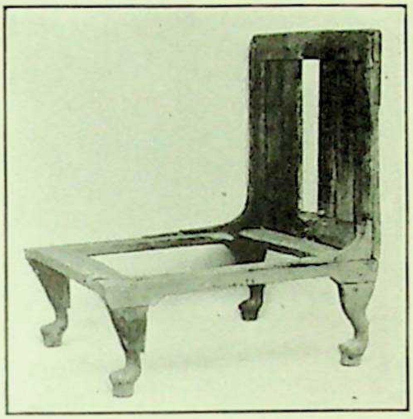
### DECORATION

The feet are mounted on bronze ferrules or terminate alone in shapes which include the dog's paw, the horse's hoof, the duck's bill, the lion's claw and slaves bound to curved swords. On couches and beds the animal forms are carried out very frequently by placing the fore legs as supports for the front of the piece and the hind legs at the rear. The backs of the more elaborate beds and chairs are carved in the forms of winged humans and divinities guarded by lions.

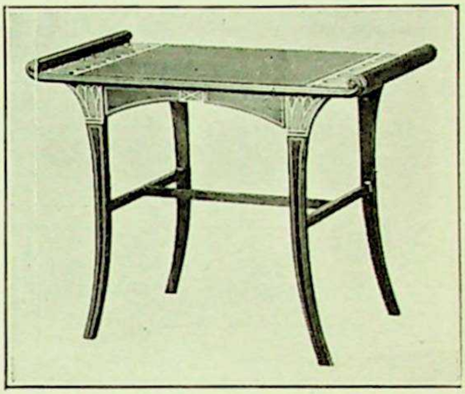
Where bronze was not preferred for the frame work, sycamore, cedar and ebony were employed, usually inlayed with ivory or silver and mounted at the corners with gold. Wood carvers and painters were strongly imbued with a racial belief that divinity expressed itself in nature. Thus we find them repeating again and again the beetle, the lotus, the scarab, the reed, the sparrow hawk, the serpent, the date palm, the papyrus bud and the lily pad, all of which possessed a distinctively symbolic character.

In chests and caskets we observe what is probably the most typically Egyptian form of decoration. Of them the painter made what are virtually history books by wording and illustrating episodes from the lives of reigning Pharaohs, hunting and battle scenes, all centering around "cartouches" or coats of arms emblematic of sovereignty over the kingdoms of the Upper and Lower Nile.

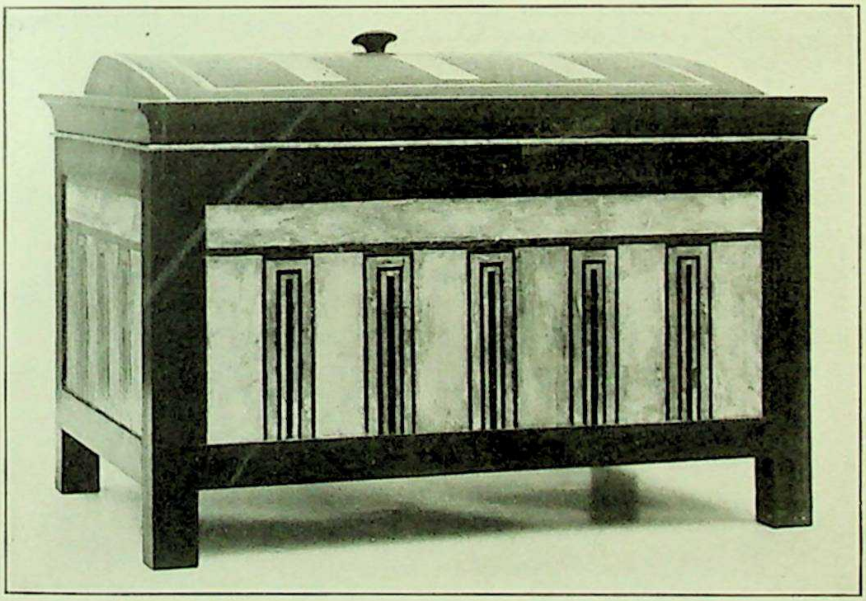
These intricate "hieroglyphics" or word pictures, were executed with red, yellow, blue and green earth colors mixed with a pale vegetable gum, very probably that of the Syrian tragacanth tree, or with the whites of eggs overlaid with the preservative gum varnish. The tiny figures required an especially fine brush and these the ingenious Egyptian made from selected reeds and rushes. The tips he soaked in water until he obtained minute separation of the fibres, whereupon he cut out the core



1

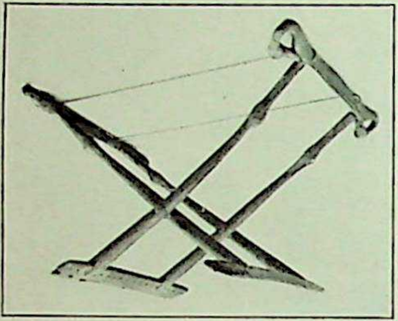


2

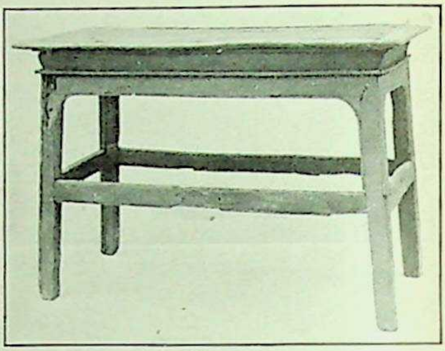


3

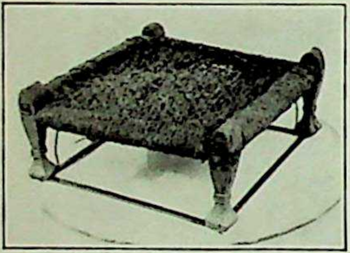
Plate 1.—1. Egyptian Carved Chair (Dog Feet). 2. Modern Table, Egyptian in Design and Decoration. 3. Egyptian Painted Casket (Restored).



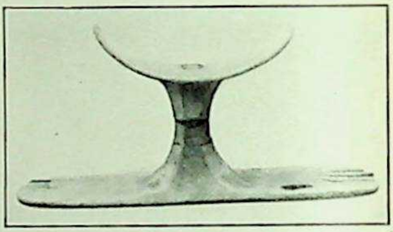
1



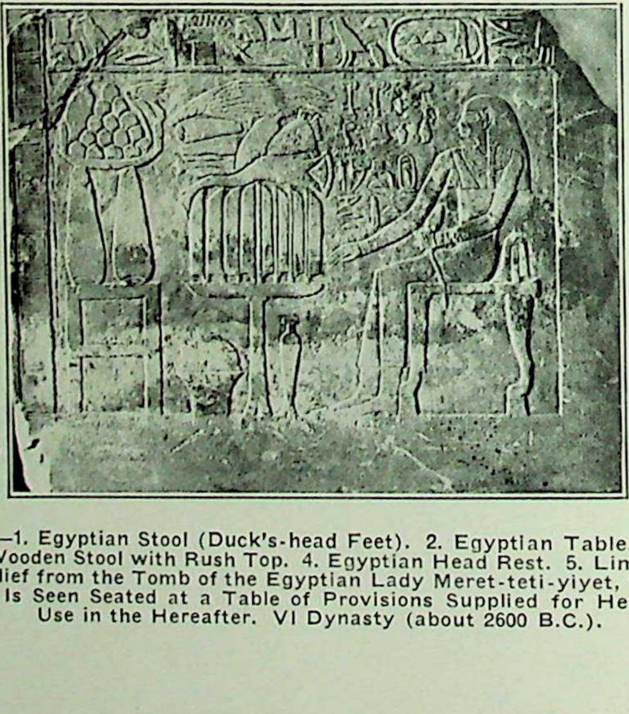
2



3



4



5

Plate II.—1. Egyptian Stool (Duck's-head Feet). 2. Egyptian Table. 3. Egyptian Wooden Stool with Rush Top. 4. Egyptian Head Rest. 5. Limestone Relief from the Tomb of the Egyptian Lady Meret-teti-yiyet, who Is Seen Seated at a Table of Provisions Supplied for Her Use in the Hereafter. VI Dynasty (about 2600 B.C.).

and bound them at the proper point, securing from one and the same piece, bristle, ferrule and handle.

### MODERN REPRODUCTIONS

Egyptian decorative motifs, both in carving and painted decoration, have been borrowed repeatedly in the history of furniture, notably during the Empire period in France when Napoleon returned triumphant from his battles around the pyramids. On the other hand, reproductions of Egyptian furniture design have never been in demand save during the brief vogue for "King Tut" at the time of the Howard Carter excavations and discoveries a few years back.

Such pieces were carried out chiefly in the field of what is called novelty furniture, a trade term for coffee and smoking tables, end tables, nests of tables and the like. These appeared either in modern painted styles with characteristic decoration or in adapted animal forms of carved walnut, picked out in color. Both are rather too striking to blend in with other furniture even as purely occasional pieces.

### THE FINISH

On a nest of tables, for instance, an enamel finish is used, banding the leg turnings in alternate succession with bright red, yellow and blue, separated from one another by rings of gold bronze. The top and aprons are painted or vein-lined with symbols in the same colors against a shade of background to harmonize, the whole softened with antique glaze.

The couch design illustrated was readily converted into a coffee or smoking table, the walnut being stained a dark tone, filled and finished with rubbed lacquer or varnish. The effect may be heightened by wiping in colors as follows: the dog's eyes green, the nose and muzzle red, the ears and mane yellow, all antique glazed. The flat table surface may be routed out in appropriate symbol patterns and colored in prior to the transparent finish coat.

# CHAPTER II

## GRAECO-ROMAN

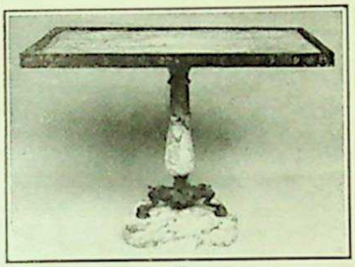
### (THE CLASSICAL PERIOD, 500 B. C.-500 A. D.)

GREEK and Roman homes, even of the better class, would seem according to our standards to have been sparsely furnished. The Greeks employed wood, bronze and stone according to the type of furniture; arch chairs (in the form of a curved X), couches, folding stools and tables with slender tripod legs. Severity of a pure type is the dominating note, expressive of a people to whom citizenship meant more than the comforts and relaxations of home life.

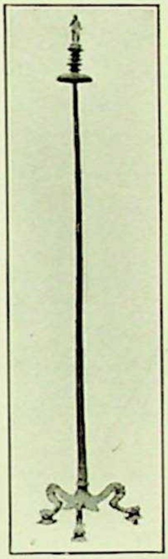
The wealthy Romans borrowed most of their furniture ideas from the Greeks and gave what little they had, tables, chairs and couches, a most elaborate character. The woods included cedar, elm, ash and beech, inlayed with box, holly, cherry, ivory, horn, tortoise shell, gold and silver. A single desk purchased by Cicero, including all of the above woods and metals, veneered and mounted to form intricate patterns, is said to have cost the modern equivalent of $45,000.

Marble-top tables had twisted bronze supports, largely in animal forms, chairs, as for example, the ''curule'' type, were backless and like the numerous stools, were built low. Bronze or wooden couches, overlaid with colorful textiles, were important pieces among a people to whom dining was a long drawn out and highly pleasurable function. Their artisans understood veneering, carving, engraving, damascening, gilding and painting, for which purpose they used earth colors mixed in the white of an egg or other glutinous substance.

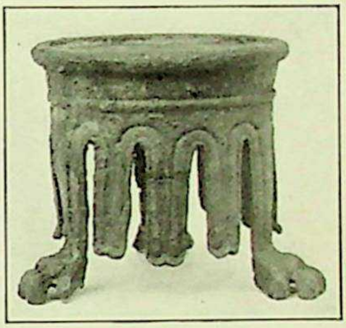
It is less in design and form than in ornamentation that Greek and Roman furniture has so strongly impressed itself on subsequent types. We still look upon as ultimate perfection in decora-



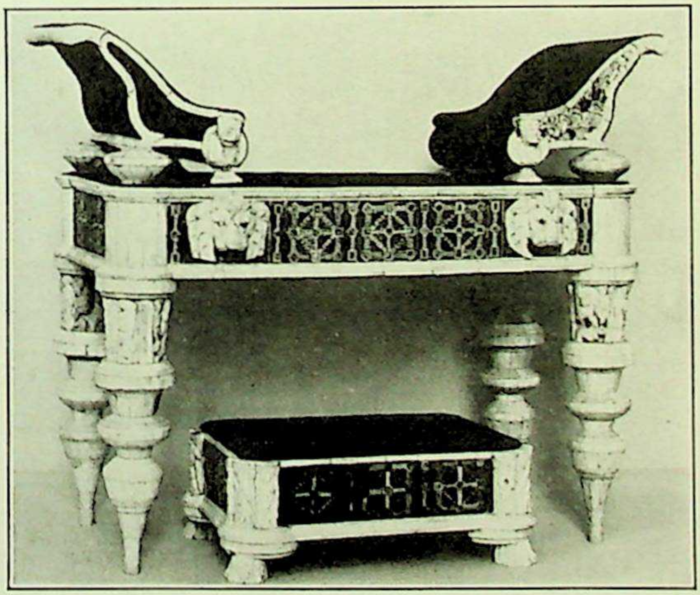
1



2



3



4

Plate III.—1. Roman Table, Inlaid. 2. Roman Tripod Torchere. 3. Roman Bronze Stool. 4. Roman Couch, Inlaid with Bone.

tive art the acanthus leaf, the Greek key, the honeysuckle, the fluted column, the scroll and the egg and dart moulding. The acanthus is said to have been originated by Calimachus, the Greek sculptor, who observed the leaves of the plant curling around a basket which had been placed upon its roots. The effect captured his imagination with the result that he immortalized it.

From the Romans we have a more virile, even warlike, scheme of decoration, notably the fasces, the sheaf of thunderbolts, the torch, the eagle, the laurel wreath and winged victory. All of these have been adapted by succeeding generations, especially by those imbued with the idea of conquest as during the French Empire under Napoleon the First when they were taken over wholesale by the artist David. Prior to this the newly excavated relics of Pompeii had drawn the Adam Brothers in England and the artisans of Louis XVI in France to employ these and other Roman motifs, but with far greater delicacy.

Since the life of the ancient Greeks was spent largely in the open, modern furniture of their inspiration is executed chiefly in outdoor pieces of natural cement or soft woods painted white. Of the latter the cheaper grades are finished with three or four coats of white lead and oil or first quality outside white prepared house paint; the more expensive grades are given two coats of flat white undercoater, followed by two of first quality long-oil white enamel. Both wood and undercoater should be sanded to maximum smoothness, end wood should be tightly sealed against moisture, and if cypress is used, the first coat should contain a percentage of benzole.

In sun room furniture the Greek note is carried out in flared legs, rounded cross-barred backs and painted decorations of profile medallions, lamps of learning or honeysuckle. The body color is shaded ivory, pale green or light blue, executed with paint undercoater and varnish, enamel or lacquer enamel.

Wrought iron and bronze chairs, ferneries, lamp bases and torcheres, marble-top tables and the like, are apt to be of Roman inspiration. Such furniture is suitable for formal halls, around formal gardens and swimming pools and as occasional pieces in living rooms and enclosed porches of large country residences. It is in no sense cozy or suitable for small homes of the cottage type, proceeding as it does from a background of marble patrician homes, cool, spacious and austere.

The rough cast iron or bronze is usually finished natural, without any attempt toward smoothing up the surface. Flat black undercoater, asphaltum or dull black lacquer is varied with a verde effect produced with a ground coat of medium chrome green in japan, followed by a stipple glaze coat of burnt umber in japan. Where the metal is machined smooth, polished black lacquer is relieved here and there by burnished gold leaf or by loops, twists, leaves and flutings high-lighted or lined with gold bronze.

# CHAPTER III

## GOTHIC

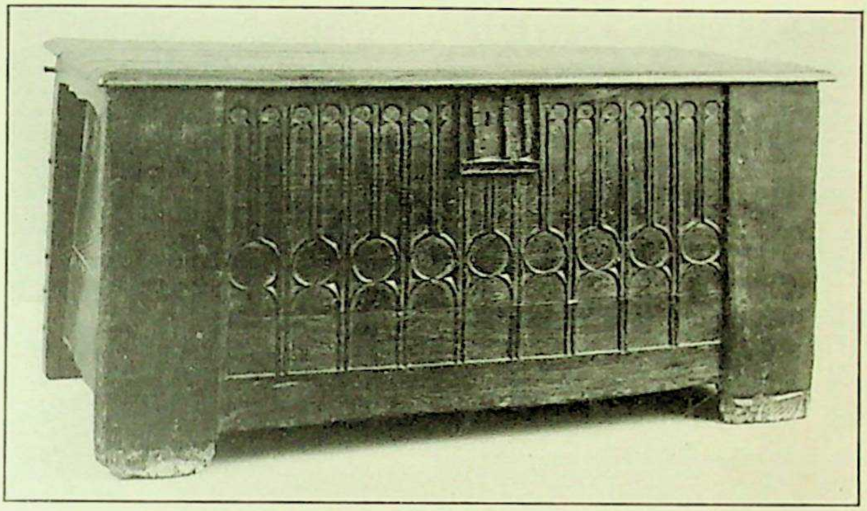
### (THE MIDDLE AGES, 1200-1443)

FROM the decline of the Roman Empire in 500 A. D., to the advent of the Gothic style of architecture, generally placed at about 1200 A. D., the arts and sciences in Europe practically ceased to exist. During this period, known in history as the Dark Ages, the continent became a vast battleground over which the chieftains of rival tribes contended for supremacy. Many of the successful ones became Christians and, abandoning their roving tent life, sought repositories for their accumulated spoils in strongly fortified castles.

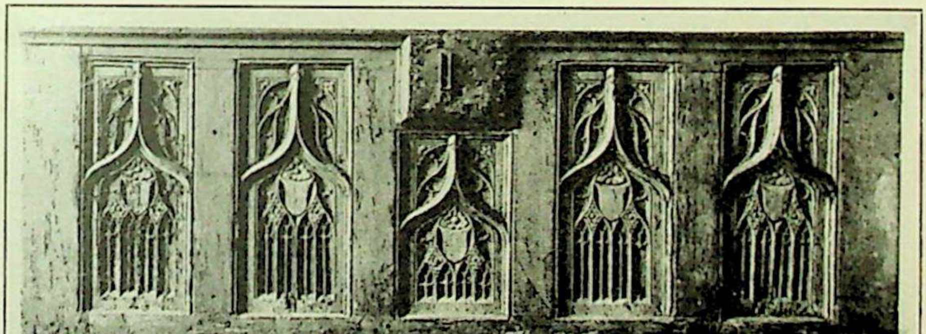
It was in the monasteries, oases in the universal clash of arms, that the dim light of learning was kept from flickering out entirely. As these institutions increased in number, sheltering all who still loved the arts of peace, the Christian church as a whole increased in power and wealth. Great cathedrals began to rise in the walled cities, equipped with furniture to match their distinctive interior and exterior design. Thus born of architecture and religion, the Gothic style remains down to today the principal influence in our church and lodge furniture design.

In its earlier manifestations, alike in architecture and furniture, the Gothic style was crude and sombre. It spread gradually over Europe, becoming known as French Gothic, English Gothic, Dutch Gothic, etc., and receiving modifications in proportion to its distance from Italy. Scandinavian Gothic, for instance, was a semi-barbaric style consisting of much scroll work twisted about hideous carved monsters, and being subject to Russian influences, was also highly colorful.

According to modern standards the interior of a feudal castle would hardly form a picture of comfort. Floors and walls were

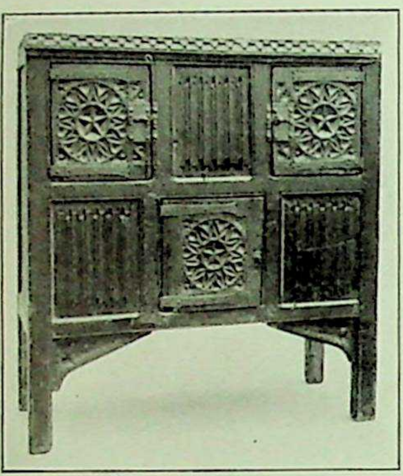


1

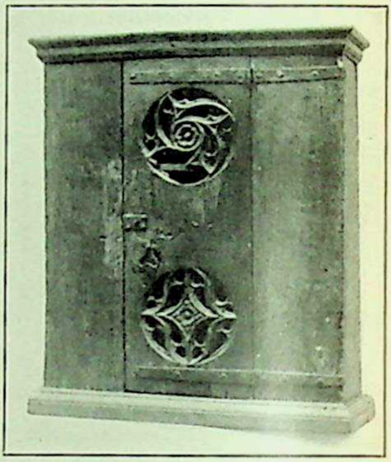


2

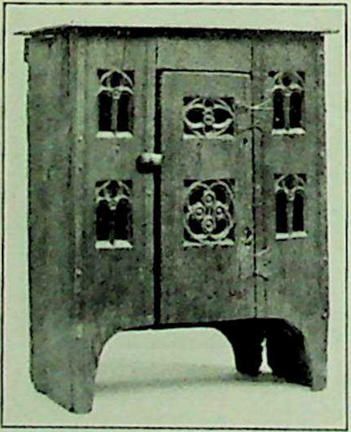
Plate IV.—1. A Gothic Chest. 2. Gothic Chest, Showing Heraldic and Architectural Treatment in Carving.



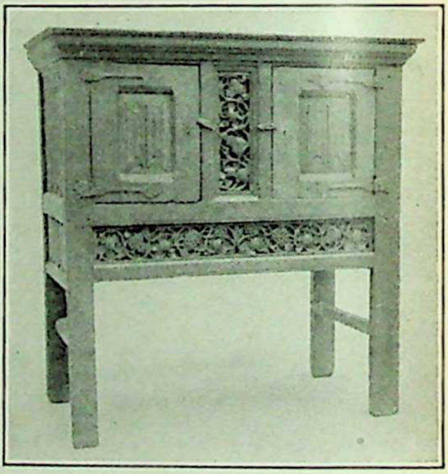
1



2



3



4

Plate V.—1. Gothic Cabinet, Showing Linen Fold Pattern and Geometrical Carving. 2. Gothic Cupboard, Showing Foil and Rose Carving. 3. Gothic Armoire, Showing Foil Carving. 4. Gothic Cupboard, Showing Linen Fold, Grapes and Leaves.

of stone, the former covered with rushes, straw or sand, the latter hung with shields and tapestries; windows were narrow, barred slits. In the thirteenth century fireplaces were introduced in place of roof vents, staircases were added and a ''parloir'' or talking room, where the women could retire. Bathing took place in wooden tubs filled from cisterns or in the castle moat. The great hall, which served also as dining and living room, was furnished with benches, stools, chests and tables; the only heat and most of the light came from an enormous hearth fire. In the early days the table or ''trestle borde'' was nothing but a narrow plank mounted on shaped standards similar to a carpenter's horse and removed after each meal. Later it was permanently attached. The lord, his family and guests sat on one side only and received service from the other. This arrangement combined with a raised platform was adopted to guard against treachery or sudden attack.

At a convenient distance was placed a table upon which servants set foods ready to be served and tasted by the cook in the presence of the lord—a customary precaution against poisoning. Later this ancestor of our sideboard was provided with shelves and doors, a repository for valuable plate and eating utensils called ''credence.'' It has been extensively reproduced of late years as a cabinet for phonographs and radios.

The feudal sleeping quarters were merely portions of the great hall partitioned off by curtains. They contained a massive four-post bed with a draped canopy reaching to the ceiling, a bench, a ''prie dieu,'' or devotional altar, one or more carved chests and an ''armoire,'' or cupboard.

With the fifteenth century, furniture became somewhat more extensive and colorful—a period of transition from Gothic to Renaissance. It is from royal account books that we get most of our information concerning the importance of color in Gothic decoration—very few actual pieces of furniture have been preserved. Thus we note in England during the time of Henry III (1216-1272) that wood panelling was first used in place of tapestries and that it was painted a green color to match a curtain. The armchair of a French princess late in the fourteenth century was painted vermillion, the seat and arms covered in vermillion morocco and cordovan, stamped with designs representing the sun, birds and other devices, bordered with fringes of silk and studded with gilt nails.

The triumph of Gothic ornamentation lies in its carving, for construction and contour were crude and bulky. All flat spaces were systematically divided into rectangular shapes and filled with geometrical tracery, twisted vines, roots, leaves, arches and the familiar linen fold pattern. As the Gothic style grew out of the spread of Christian religion it is also replete with Christian symbolism. Thus the carved trefoil represents the Trinity, the quarter foil the four gospels and the cinque foil the five epistles; the dove is the Holy Spirit, the lily, purity, the rose, the sweet odor of sanctity, the circle, eternity. The ivy expresses the clinging of the Christian to his religion and the oak leaf the strength and endurance of divine power. On more elaborate pieces, the panels are carved in relief or painted to show landscapes, castles, scenes from tournaments, the chase, the battlefield and biblical history.

Gothic originals were of oak (English), chestnut (French), and walnut (Italian); modern reproductions are chiefly in oak stained any deep brown color, shellaced without filling and waxed or given a coat of flat varnish. The age-old dignity of the style renders it particularly effective in spacious libraries and shadowy halls, appearing in scattered pieces—a hall chest here, a wall cabinet there with a joint stool in the living room to serve as a coffee table. Attempts to adapt it to modern walnut dining room suites, while executed with considerable skill, have not succeeded in attaining any widespread popular recognition.

# CHAPTER IV

## ITALIAN RENAISSANCE

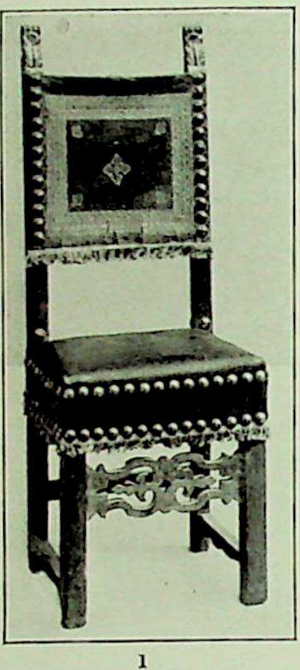
### (THE CLASSIC REVIVAL, 1450-1650)

RENAISSANCE, a French word, meaning literally "rebirth," refers to a period in European history when artists and thinkers sought to revive the charm of Greek and Roman classic forms in art, literature and decoration. Scorning the narrowness of medieval superstition and ignorance, they dubbed its creations Gothic, a term of disdain, signifying barbaric, coarse and crude. The practical adventurous mind, too, was stimulated—the printing press came into use, gunpowder was invented, and Columbus initiated his voyages of discovery.

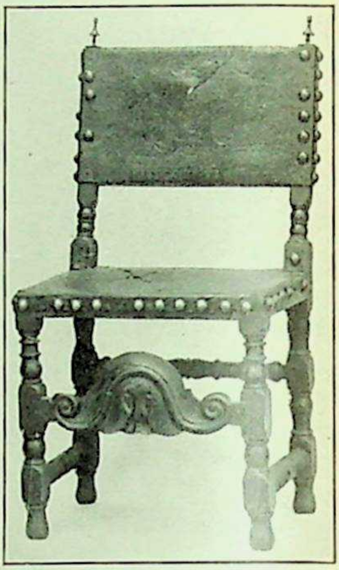
Encouraged by an accompanying period of peace, Italian artisans created designs of great beauty, and as their apprentices travelled to other countries to set up for themselves, the original style was modified in their reproductions until museums show an array of pieces all suggesting one another, but labelled variously as Italian, Spanish, English, French, Dutch, Flemish and German. Because of distinctive departures, the furniture of Renaissance England and Spain requires separate treatment.

Furniture remained massive and architectural, but became more diversified as the gloomy medieval castle gave way to the more spacious Renaissance "palazzo." Seats increased in number, if not in comfort, tables became more ornate and the cabinet (credenza) and chest (cassone) were greatly elaborated. Later in the period, sofas and consoles were created—in fact, during these two centuries, many of the forms with which we are now familiar first came into being, no longer unrelated, but grouped for use in certain rooms.

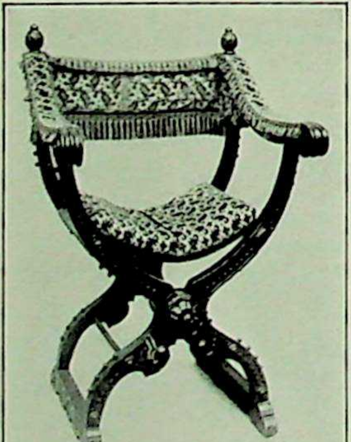
The distinguishing characteristics of Renaissance include angular contours, lyre-shaped and colonnade supports for tables;



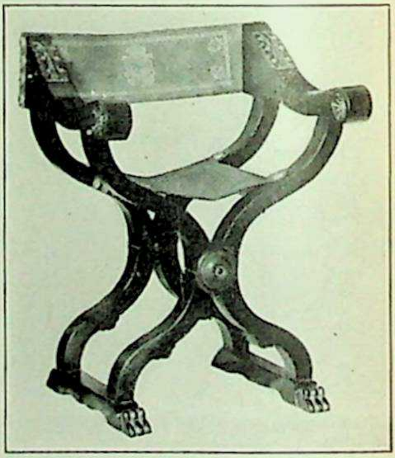
1



2



3



4

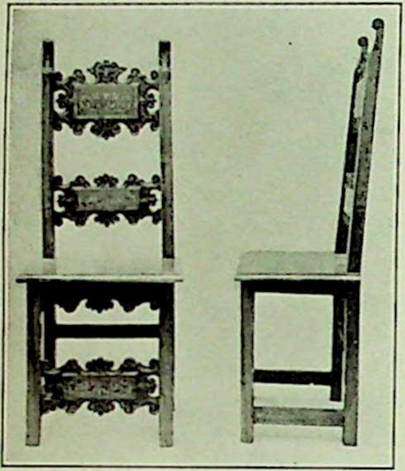
Plate VI.—1. Italian Renaissance Side Chair, Showing Leather Seat and Velvet Back. 2. Spanish Renaissance Chair. 3. Dante or Savonarola Carved-X Italian Renaissance Chair. 4. Modern Reproduction of Roman or Dante Folding Chair in Walnut with Hand-tooled Colored Leather Seat and Back, Antique Dusted in Carvings.

floor runners, pierced stretchers and splats on chairs; fluted columns upholding the bed canopy; arms and backs on the lid of a narrow seat chest (cassa panca); scroll, claw and block feet, rosette and acanthus finials. Chairs grew into three types: the Dante or Savonarola curved X "sedia," the straight, square-padded seat with crowned uprights, and the small, curve-shape, developed from the stool and adapted in our time for telephone seats.

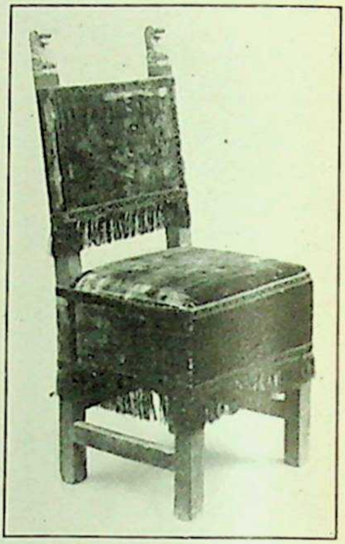
In the earlier years the Italians showed themselves artists first and wood carvers or cabinet makers secondarily. Hence their style quickly became rich and colorful. Where fine woods and skilled carvers were lacking, they painted or gilded cheap lumber and resorted to applications of a moulded plastic material, called "gesso duro," very hard and especially suited to bas reliefs. Chair seats were padded and covered with leather, painted in heraldic emblems of green, blue, red and gilt, fringed at the front and sides, and held in place by large round brass nail-heads.

A favorite form of ornamentation for flat surfaces was "intarsia," consisting of geometrical designs set in ebony, chestnut and brown walnut. At first the inlay was bone or ivory, then different colored woods were employed to produce more elaborate designs, some beautifully pictorial, on the order of mosaics. In the sixteenth century "pietra dura" became the fashion, being an inlay of highly polished marbles, agates, hard pebbles and lapis lazuli, followed later by arabesques in tortoise shell, brass, silver and mother of pearl.

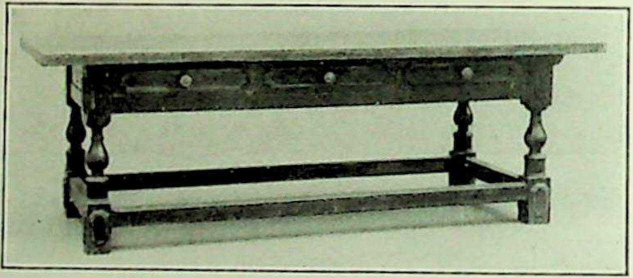
As previously indicated, the Renaissance in most other European countries followed Italian lines rather closely. The French from Francis I to Louis XIII (1515-1615) shows greater delicacy in carving and less reliance on color. In Germany (1525-1620) the style was characterized by fondness for rococo, architecture and close adherence to realism, preferring oak carved into coats of arms, biblical and classical scenes. Flemish (1520-1636) was geometrical in outline and carving, strongly influencing Elizabethan and Jacobean artisans across the channel. The Dutch (1520-1634) preferred plainer surfaces ornamented with colored



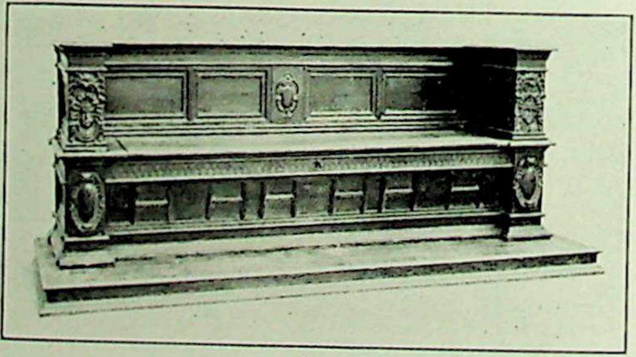
1



2

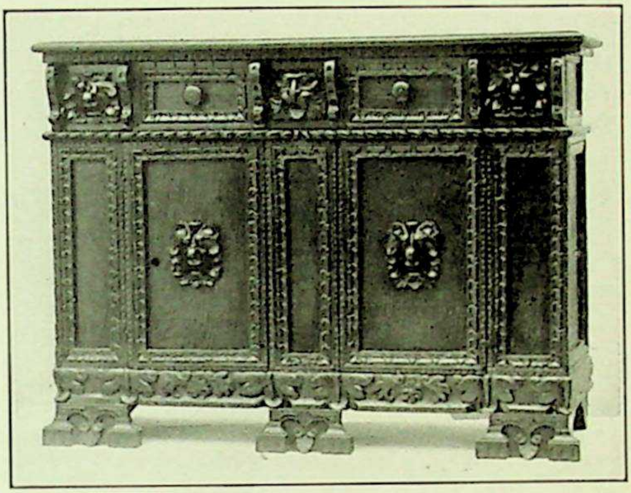


3

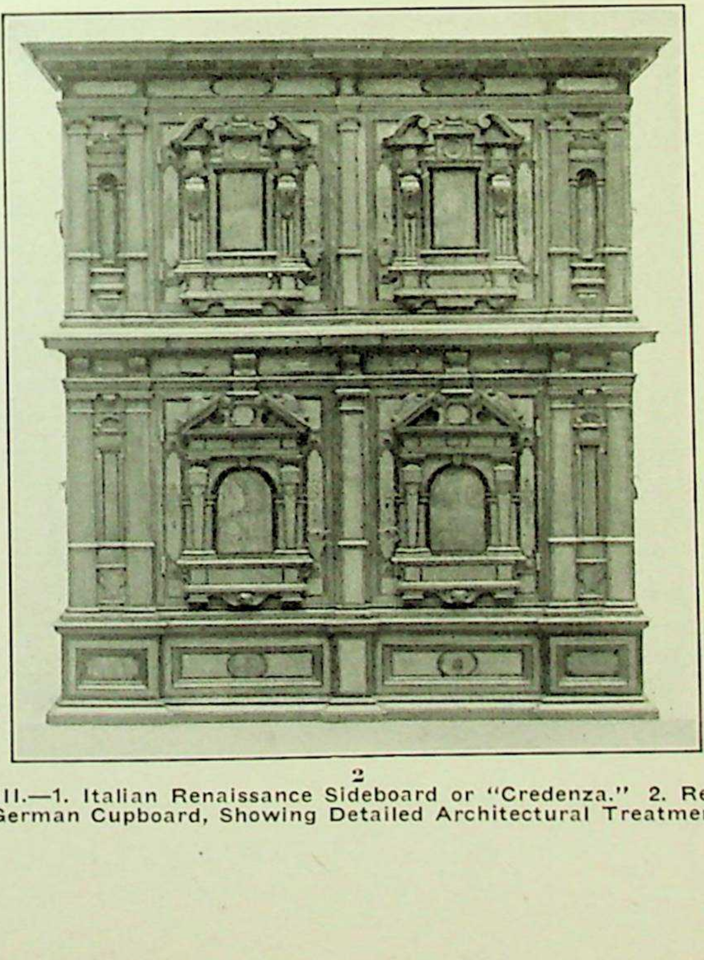


4

Plate VII.—1. Italian Renaissance Carved Chair, Showing "Intarsia" Insets. 2. Italian Renaissance Velvet Upholstered Chair. 3. French Renaissance Long Table. 4. Italian Renaissance Carved "Cassapanca."



1



2

Plate VIII.—1. Italian Renaissance Sideboard or "Credenza." 2. Renaissance German Cupboard, Showing Detailed Architectural Treatment.

woods brought back by traders from the East Indies—a style known as Dutch Marqueterie.

In this country the close of the World War marked a notable revival of interest in Renaissance furniture, and in the Italian style, was reproduced extensively for the hall, the dining room and living room. Unfortunately the polychrome form of decoration was over-emphasized, making it rather too ornate and florid for steady diet, especially as the average modern room is too small to afford a background comparable to the vast, high-ceilinged apartments of the Florentine and Genoese nobles.

The artisans of the Renaissance period, of whatever nationality, knew nothing of our modern wood finishing methods except possibly with respect to color work. The solid wood was patiently rubbed and rubbed with vegetable oil until it glowed with the soft mellow glow we associate with wax or velvet. But when not repeatedly so treated, as was often the case, the wood pores collected dust and took on a grayish appearance. It is this effect, with those resulting from centuries of wear or neglect, that we attempt to reproduce today with modern materials, the shade depending on the wood employed.

Brown Italian walnut requires the deep antique shade of stain, high-lighted, left unfilled and finished with clear wax over a thin film of lacquer or shellac. Gray Italian walnut calls for a one-tone gray stain with a slight brown cast, the pores partly filled with gray wood filler, protected as for the brown. Italian gray oak is stained about the same shade as mission weathered oak, high-lighted, shellaced and finished with gray liquid wax. Italian red oak is stained a reddish brown mission color, high-lighted, shellaced and finished with clear wax. All of the finish should have an antique appearance with a soft lustre and the least possible body of film.

Polychrome is appropriate on all but the red oak and may be applied to all turnings, flutings and carvings in red, green, blue and gold. An egg and dart moulding, to cite an example, may be painted in alternate colors on the egg designs, the arrows in gold, the depressions in black or brown and the whole antique glazed and high-lighted.

# CHAPTER V

## SPANISH RENAISSANCE

## (1500-1700)

UNTIL affected by the general European intellectual awakening known as the Renaissance, the furniture of Old Spain (Castile and Aragon) shows little in the way of individuality. The most accurate classification would probably be French and Flemish Gothic with departures traceable to Moorish influence, but of these very few original pieces have survived. Incidentally the world may count it a loss that with the expulsion of the Moors so little of their handiwork, apart from architecture, escaped the vengeful destruction of all things infidel. The Moor, nevertheless, left his decorative impress on many of the arts.

The Spaniard of the sixteenth and seventeenth centuries was cruel, proud and loath to accept new ideas so that we find his furniture a thing of crude beauty, allied decoratively to contemporary Italian forms but without their elegance and fine craftsmanship. He scorned comfort for strength and harsh simplicity and ladies of the highest rank were expected to sit bolt upright or retire to bed while their consistent, if arrogant, husbands likewise spurned furniture which would permit them to lounge.

The room of King Phillip II (1556-1598) has been preserved to us and suggests the proper setting for modern reproductions. It shows plain white plaster walls relieved only slightly by a wainscot of blue and white tiling, green painted shutters, sombre oiled pine doors and oak beams crossing the ceiling. This severity was varied in the palaces of bishops and grandees only by the introduction of black or red tile floors and mural decorations or tapestries depicting scenes from the Bible or early Spanish history. Furniture in all of them is sparse and rugged, hardly conforming to the ideas of aristocratic comfort which then prevailed in other parts of Europe.

Of typical pieces we have chairs, tables, benches, chests and *vargueños.* Chairs were of two types, one rectangular with corded, solid wood or stretched and nailed leather seats, arcaded wood and tooled leather backs, pierced front leg stretchers, scroll

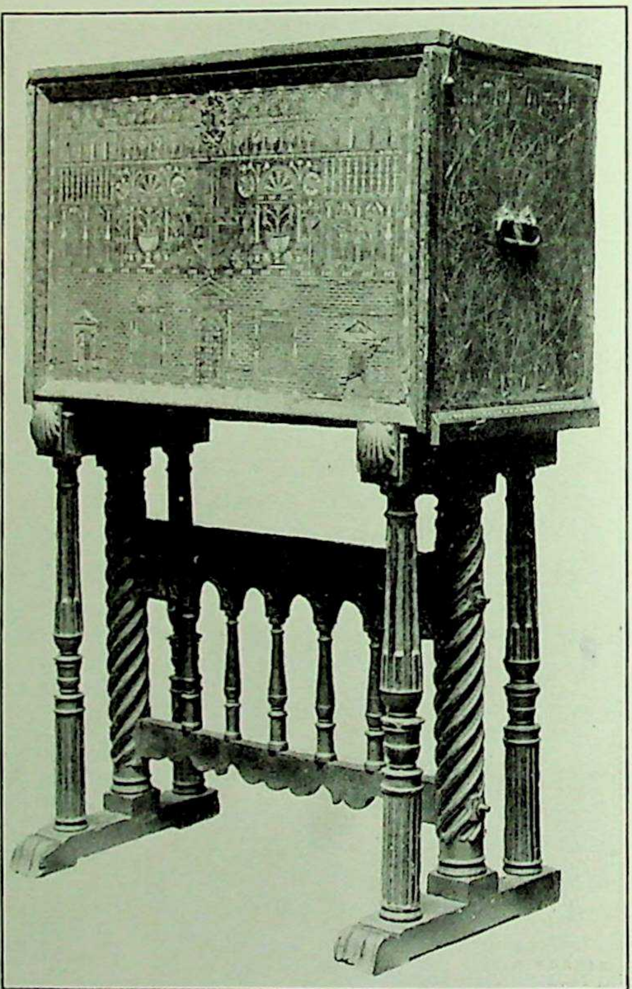
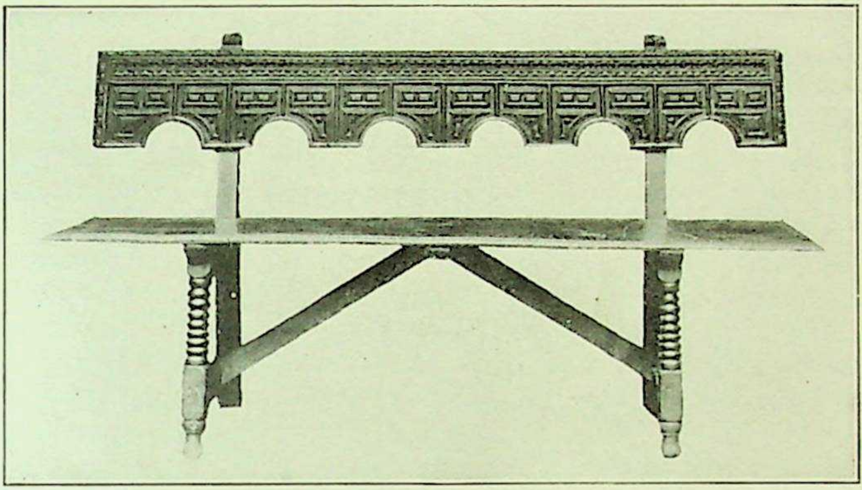
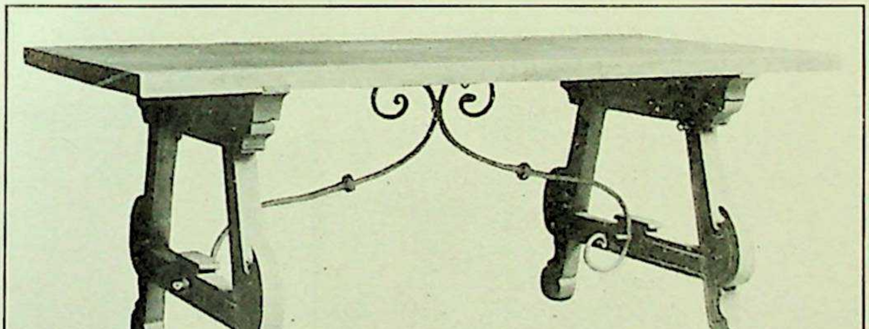


Plate IX.—Spanish Vargueño, Showing Minute Inlay in Moorish Spirit with Heraldic Center.



1



2

Plate X.—1. A Spanish Bench, Showing Typical Hand Carving and Gouging.
2. Spanish Long Table, Showing Wrought Iron Underbracing.

and square column legs. In Catalonia these chairs were often elaborately lacquered red and green and decorated in gold. The other or hip-joint style of chair was a Spanish version of the familiar curved X Savonarola or Dante Italian chair. Like other pieces this "chair of dignity" was frequently ornamented with carved geometrical circle designs, chipped out in tiny half moons or inlaid with intricate patterns of bone, boxwood or ivory, all of marked Moorish inspiration.

Tables and benches show heavy turned legs splaying outward and ornamental curved and twisted iron bracing; chests are of oak carved in rosette patterns or with portrait profiles set in medallions or with raised diamond shaped Moorish panelling not unlike the Elizabethan and Jacobean style in England. Buffets and cupboards akin to the "armoires" of France have arcaded spindles in the upper compartments, the lower part being the conventional high chest.

It is in the *vargueño* that we have what is beyond doubt the most typical Spanish piece of furniture. Castilian in origin, it served the double purpose of desk and cabinet and consists in the upper part of a rectangular box the face of which hinges down, revealing a multitude of little drawers and doors. The lower part is a narrow table with spiral or spindle turned legs fortified by a colonnade, or in some instances, with iron bracing.

Decoratively it is also unique, chiefly in the upper part which may be painted or lacquered red or black. At the top is a primitive lock of the hasp or staple type, at the bottom hinges of the same metal, brass, bronze or iron. In the front of the door panels are set curiously pierced lozenge-shaped Moorish plaques, gilded, if not of brass, and nailed over red velvet. The interior is inlayed in pictorial, arabesque or geometrical designs with tiny bits of gold, silver, ebony, bone or tortoise shell.

In woods the Spaniard gave first preference to walnut, next to oak, chestnut and red pine in the order named. In the eighteenth century there was some swing to mahogany, but in all cases veneering was avoided in favor of the solid wood. The methods of decoration were few and have been described, notably painting, Moorish inlay and carving. Fringed velvet and embossed leather seats and backs on chairs provided red, blue, green and yellow color relief against a frame of dark oiled walnut. These coverings are attached with large round-headed nails, hammered through the wood and crudely bent back on the reverse.

The vogue for modern reproductions grew out of a desire to furnish California and Florida homes of Spanish and Italian

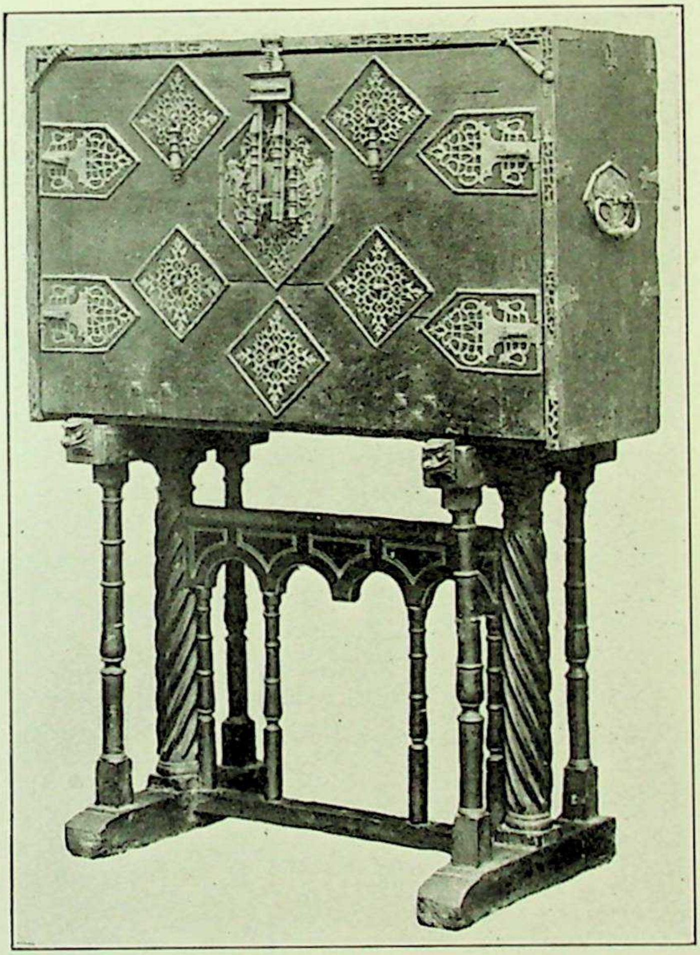


Plate XI.—Spanish Vargueño, Showing Characteristic Metal Plaques and Colonnaded Underframing.

architectural inspiration in styles to harmonize. These styles have been produced principally for the bedroom, dining and living room, executed in walnut and gum, and modified to a greater or lesser extent in point of design. For instance, the *vargueño* may become a dining room china cabinet as well as a living room wall desk, the metal mounts supplanted by scroll wood overlays, the iron underbracing imitated with a stipple-painted wood. The spindles, arcaded underframing, leather upholstering and diamond panelling are usually preserved intact.

The sombre oiled "patina" of originals is approximated by an antique walnut finish, the burl panels shaded almost to black around the outer edges, the turnings and raised parts highlighted, and the final varnish or clear lacquer coat rubbed to a medium eggshell lustre. The *vargueño* is painted or lacquered red, the same vermillion color appearing on other pieces of the same set through the pierced design of the hardware mounts. Iron underbracing is polychromed here and there with red, green and gold, antique glazed and sometimes dusted.

Before closing the subject of Spanish furniture, reference should be made to its influence on the Mission style so popular in this country two or three decades ago. The direct inspiration was received from the Spanish seventeenth century arm chair, copies of which were constructed in a crude way by missionaries working up the California coast from Mexico where they naturally made pieces to which they were used at home. When discovered and exploited by American manufacturers, the latter unfortunately emphasized the crudeness and bulkiness of the copies instead of seeking out and patterning after the more graceful originals of Old Spain. As a consequence the style perished—crushed, as one might say, under its own cumbersome weight.

# CHAPTER VI

## TUDOR AND ELIZABETHAN

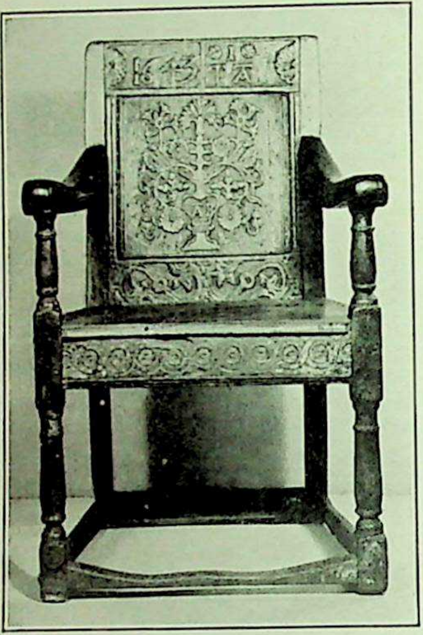
### (THE ENGLISH RENAISSANCE, 1485-1603)

THE battle of Bosworth Field ended the long drawn out contest between the Yorkist and Lancastrian factions for the English throne and brought about the accession of Owen Tudor as Henry VII. It also marked the close of the Middle Ages in England and the beginning of a much needed era of peace under succeeding sovereigns of the house of Tudor, Henry VIII, Edward IV, Queen Mary and Queen Elizabeth. The latter, owing to the vigor and prosperity of her reign, gave her name to a distinctive period.

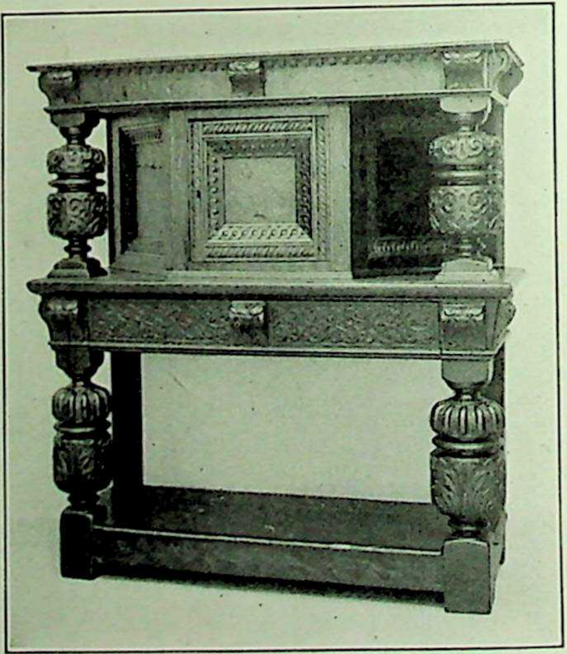
The introduction of Renaissance ideas into England is attributed to Henry VIII in that he imported Italian artists and artisans whose work naturally influenced that of native designers. There were no radical changes, however, until Flemish wood workers, fleeing across the channel from the persecutions of Spanish Alva, were given refuge by Queen Elizabeth. So marked was their impress on contemporary cabinet making that her name has been given to a distinctive period.

Furniture in Tudor and Elizabethan times was less largely confined to the homes of the rich and powerful, for increased trade and travel had created a comparatively wealthy class of merchants and farmers. Notable was the massive bedstead with its four elaborately carved posts supporting a high canopy. There were also heavy refectory tables, carved chests, wainscot chairs, cupboards or hutches, and stools. Under Queen Elizabeth, as a variation from Gothic tapestries, Inigo Jones introduced oak panelling for walls, harmonizing with beamed or ribbed ceilings, broad staircases and huge hearths.

Tudor furniture still followed architectural lines, being heavy,

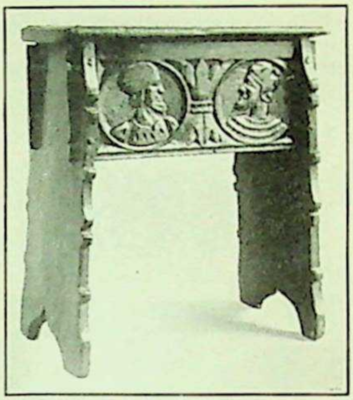


1

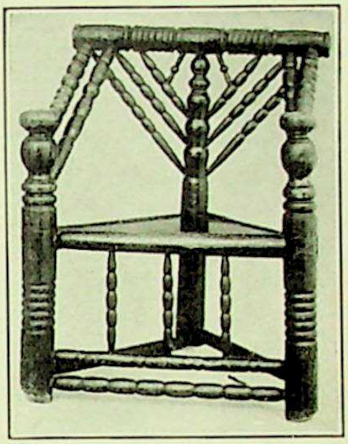


2

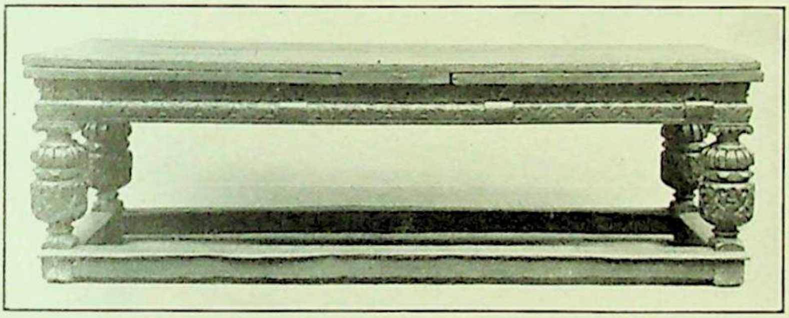
Plate XII.—1. Tudor Wainscot Chair in Oak, Showing Flat Carving with Mingling of Rose and Gothic Survivals. 2. Elizabethan Court Cupboard.



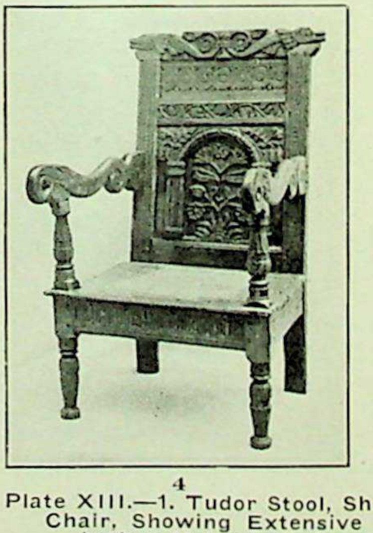
1



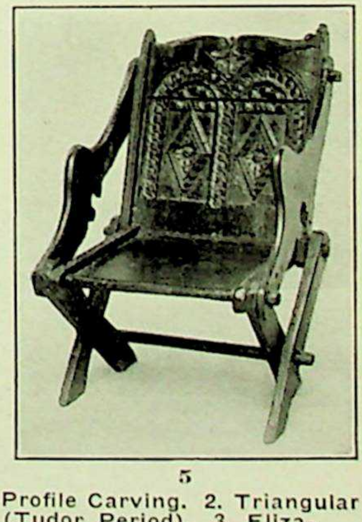
2



3



4



5

Plate XIII.—1. Tudor Stool, Showing Medallion Profile Carving. 2. Triangular Chair, Showing Extensive Use of Turning (Tudor Period). 3. Elizabethan Melon-bulb Draw-top Refectory Table. 4. Tudor Wainscot Chair, Showing Thistle and Rose Carving. 5. Glastonbury Folding Chair (Tudor Period).

unwieldy and uncomfortable. The style shows many Gothic survivals, notably the linen fold pattern, mingled with carved Renaissance details, profile medallions, armorial bearings and the Tudor Rose. This last was derived from the distinguishing emblems worn by the opposing parties in the War of the Roses, white for York, red for Lancaster, combined with peace to form part of the royal badge of England and perpetuated on furniture in the form of a conventionalized rosette.

Elizabethan pieces show rectangular contours and elaborate carving, worked out in further Renaissance details to include arabesques, garlands and leaves, portrait medallions and caryatid columns; also heraldic motifs, coarse strap work, in imitation of harness, and melon bulb legs for tables, connected by stout rails just clearing the floor. For while carpets first came into English use during this period, the majority of floors were covered as in Gothic times with rushes or reeds and stretchers served as a perch for the feet to escape the unsanitary condition resulting.

With the Elizabethan period, the age of oak in English furniture reached its pinnacle, although as before, elm, beech, chestnut, ash, walnut, sycamore and cypress were also used to some extent. Mahogany, a strange wood not employed in cabinet making until considerably later, was first brought into England by Sir Walter Raleigh. Upon his return from a voyage to the West Indies in 1597 he invited Queen Elizabeth aboard one of his ships, the deck of which had been partially repaired with a peculiar brownish red wood. When she expressed her admiration of its coloring, Sir Walter ordered the planks removed and made into a table for his royal mistress.

However, modern furniture of Tudor or even Elizabethan inspiration cannot, strictly speaking, be executed in mahogany with any idea of historical precedent. Hence, so-called "Tudor Mahogany" occasionally advertised is merely an English Renaissance design with a mahogany finish. The majority of present day reproductions are carried out in walnut or oak. Tudor designs take the form of radio and phonograph cabinets, dining room and sometimes bedroom suites, all considerably modified alike in size, design and ornamentation in order to meet modern requirements and limitations of expense. Elizabethan reproductions appear in dining room suites, library and living room pieces, where for maximum decorative effect they should appear as the originals against a background of oak panelled walls. Dignity is the keynote of both styles.

During Tudor times furniture was painted—a difficult thing for us to realize, due to the fact that on the few surviving originals the paint has worn off, revealing the oak, unpreserved by wax, oil or polish. Thus while there is little for us to go by in the way of finish color, oak reproductions are customarily stained Jacobean or variations ranging from greyish to reddish. The grain is left unfilled, protected with clear lacquer, varnish or shellac and wax. High-lighting, shading and antique dusting greatly enhance the effect, the latter being largely confined to odd living room pieces.

There is no standard shade for walnut although two-toning is largely practiced to emphasize and partially to take the place of the rectangular panels so characteristic of the originals. Inlaying with ebony and vein lining with gold bronze are examples of purely modern decorative treatment. The walnut after staining is shaded where not two-toned, then filled and finished with clear lacquer or varnish to a smooth, rubbed effect.

# CHAPTER VII

## JACOBEAN

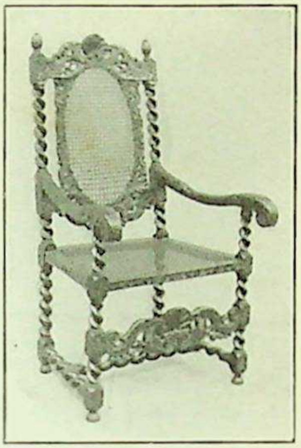
### (THE STUART-CROMWELLIAN-RESTORATION ERA, 1603-1689)

WITH the death in 1603 of England's virgin queen, Elizabeth, the English sovereignty passed to the house of Stuart in the person of James I of Scotland, thus for the first time uniting the two crowns in one. The term Jacobean is derived from "Jacobus," the Latin for James, and is used to describe a period in the development of English furniture and architecture comprising the reigns of both James and his ill-fated son, Charles I, beheaded by order of Parliament in 1649.

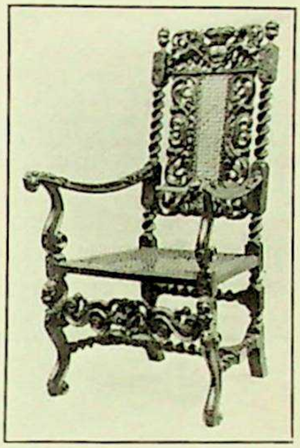
During the succeeding eleven years England was ruled as a commonwealth by the stern Puritan dictator, Oliver Cromwell. The wandering Stuart claimant was not able to mount the throne until 1660, two years after Cromwell's death. His reign, with that of his successor, James II, is known as the Restoration or Carolean period. As we are still in an era when furniture styles drew their inspiration from the court of the reigning monarch, a familiarity with the political background is important.

Up to the time of Cromwell, English furniture was chiefly Renaissance modified to suit the less ornate English taste. The Commonwealth, frowning on love of comfort and the decorative arts, introduced straighter lines and a general atmosphere of rigidity and repression. With the return of the pleasure and luxury-loving Charles, came a violent reaction in favor of all the continental flourishes and refinements with which he had become so familiar in his exile.

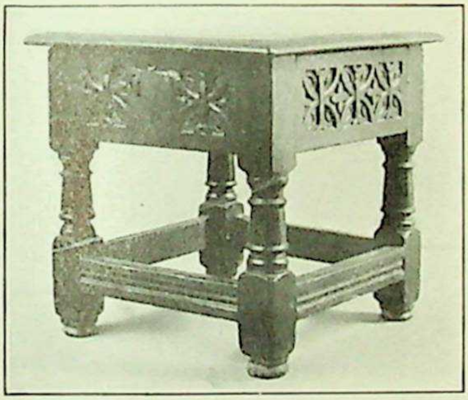
The home of the Jacobean-Cromwellian period was made up of various low-ceilinged rooms to which may be attributed the squat character of the furniture. Notable pieces include the



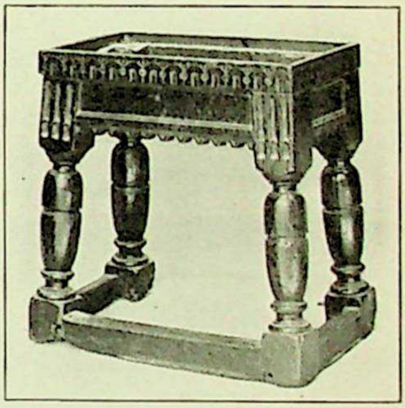
1



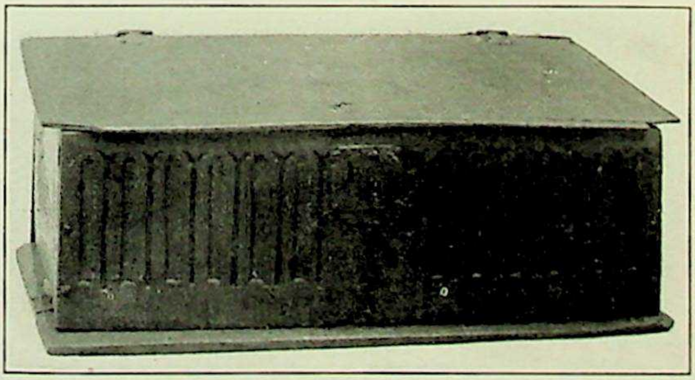
2



3

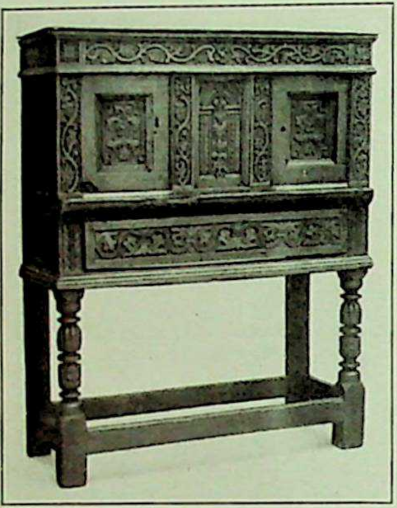


4

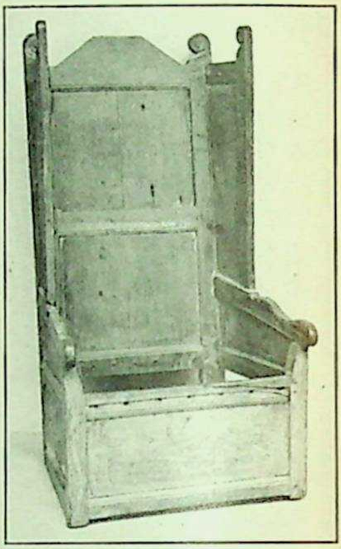


5

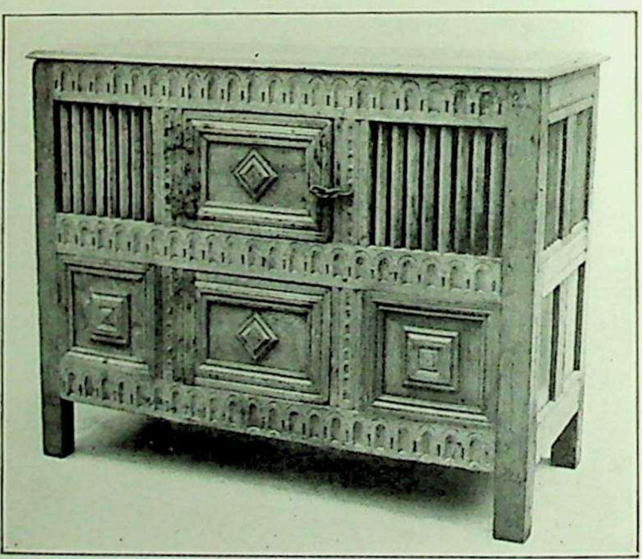
Plate XIV.—1. Restoration Chair, Showing Crown and Tulip Carving. 2. Restoration Cane-Back Armchair, Showing Spiral Turning. 3. Jacobean Turned and Carved Stretcher Stool. 4. Jacobean Stretcher Stool. 5. Jacobean Desk-box.



1



2



3

Plate XV.—1. Jacobean Court Cupboard, Showing Gothic Survivals. 2. Cromwellian Wing Chair. 3. Jacobean Cupboard, Showing Diamond and Square Carving.

curved X and wainscot or panelled back chairs and a profusion of tables—gate-leg, three-cornered, refectory and draw top. Though chairs grew in use among the lower classes during the Cromwellian period, stools continued popular and were greatly elaborated, in many cases built to extend the width of the fireplace and provided with turned legs and stretchers. Of other pieces there were carved four-post beds and chests, and cupboards provided with drawers in place of doors and shelving as heretofore.

In style Jacobean remained rectangular though somewhat more movable. From Dutch sources came the ball or bun foot for chests and Flemish scrolled instead of straight stretchers. Chair backs were perpendicular, wide and generally low, either carved, railed or spindled; seats were high, for use with foot stools, and were of plain wood or padded with leather. Bulbous legs on tables were carried over from the Elizabethan period and cabinet fronts were panelled in pleasing geometrical designs. During the Commonwealth everything was of the plainest construction, heavy in form and rather lacking in grace.

With the Restoration the lingering architectural note finally disappeared. Walnut and chestnut replaced the time-honored oak and with them came a host of French and Flemish influences, notably high, carved chair-backs framing a caned or upholstered central panel, spiral carved legs and pierced scroll stretchers. Dutch marquetry on chests provided beautiful drawer panels in ivory and bone patterns representing flowers, leaves and elaborate arabesques. In carving the so-called "crown and tulip" was a favorite Carolean motif.

Jacobean is interesting as the first period to show a vital influence on the design of modern American furniture; it was also the first to be imported into this country in Colonial times. Present day styles take the form of moderately priced dining room suites, although there is also a considerable representation of odd hall and living room pieces, all very much modified and brought up to date. Cromwellian is rather too ascetic for twentieth century tastes, but it continues to provide inspiration for some very fine adaptations in the bedroom line. Restora-

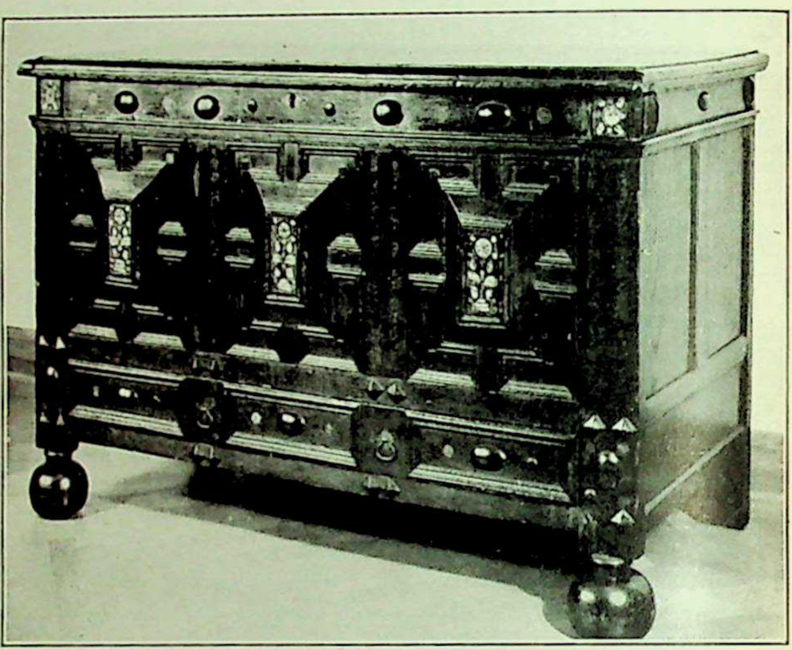


Plate XVI.—Oak Chest of Jacobean Period, Showing Typical Geometrical Panelling and Early Use of Marquetry.

tion reproductions for choicer living room pieces include high-back chairs, cabinets, footstools, daybeds and chests of drawers.

In grouping, Jacobean and Cromwellian pieces bespeak the informality of a cottage or small home and so are related to early Colonial furniture. Carolean or Restoration, on the other hand, belong in more pretentious surroundings, expressing very much the same spirit of regal dignity as Louis XIV. The former have been modernized into democratic "suites," the latter has retained the atmosphere of the salon, rendering it appropriate for the large hall or drawing room, and for metropolitan clubs and hotels.

Oak or walnut are the favorite woods; mahogany is historically incorrect, but is frequently found finished a deep brown shade commercially known as "antique." Jacobean oak is a standard shade in itself and an oil stain carries out the effect very satisfactorily. The pores should be left unfilled, sealed over with shellac or lacquer, and waxed to give the mellow glow of originals. Jacobean joiners were apt to leave their oak unfinished; others oiled leaving the pores dark, others waxed leaving them light.

Walnut is best stained an antique shade with either oil or water stain, high-lighting all raised parts as with oak, and shading the outer edges of the panels. Filler may be used or omitted, but the final finish should be dull rubbed lacquer or varnish. Plain figured walnut is preferable to fancy veneers, as the full beauty of the designs is brought out in the carving, caning or marquetry.

# CHAPTER VIII

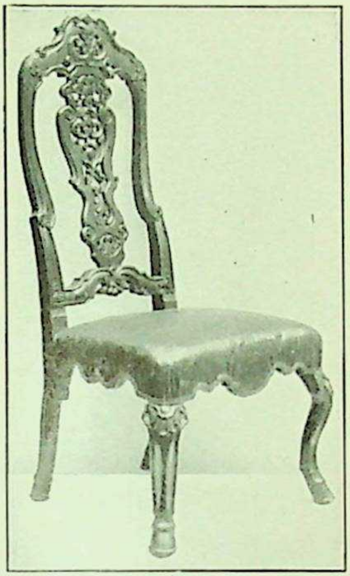
## WILLIAM AND MARY

### (THE BEGINNING OF DUTCH INFLUENCE, 1689-1702)

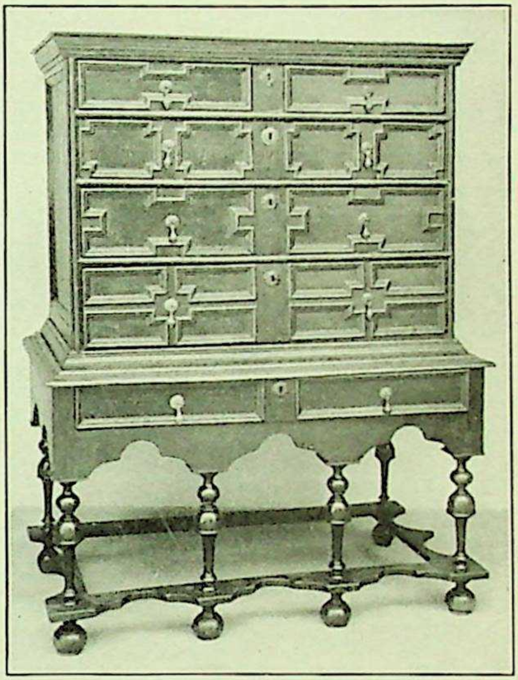
THE year 1689 witnessed the accession to the English throne of Mary, daughter of Charles I, and her Dutch husband. William of Orange, summoned from across the channel by a nation weary of Stuart intrigue and craftiness. Whereas the deposed monarch, James II, sought with Louis XIV only temporary refuge, parliament chose to regard his departure as equivalent to abdication and without further ado declared William and Mary joint sovereigns—hence the coupling of their names in referring to the furniture period they identify.

While the entire period lasted but twelve years it was marked by radical innovations as to furniture design and with respect to actual pieces by considerable changes from the Jacobean era. A typical home of the aristocracy or better middle class would contain most of the articles now in use mingled with survivals of the dying Renaissance civilization. Although still rectangular in character, furniture became lighter and easier to handle and clean, in fact, generally more modern and homelike.

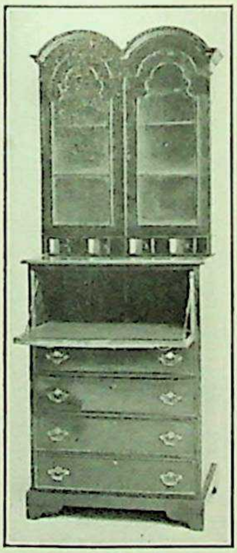
Bedsteads were still Tudor in design, but less massive and with slenderer posts. The "highboy" was introduced in the shape of a chest of drawers mounted on a six legged table of which the front and sides were provided with an apron. The "lowboy" was a similar article modified in size to show four legs, and two or three, instead of four, drawers. The "tallboy" is a combination of the two whereby a smaller chest of drawers surmounts a wider set. Desks were devised with hinged fronts to drop down and provide a writing surface, the familiar secretary type with drawers below and a glass fronted bookcase at the top. A variety



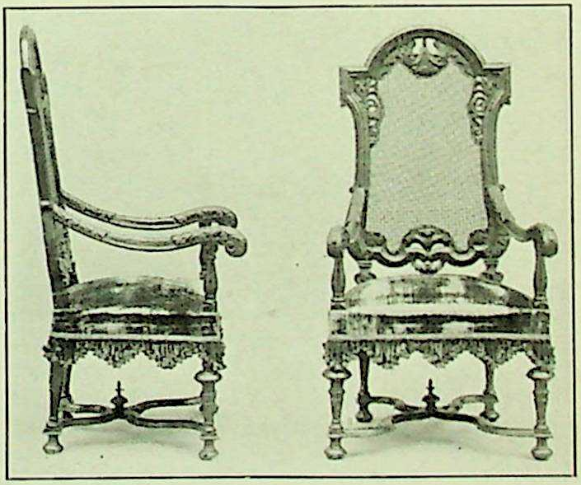
1



2



3



4

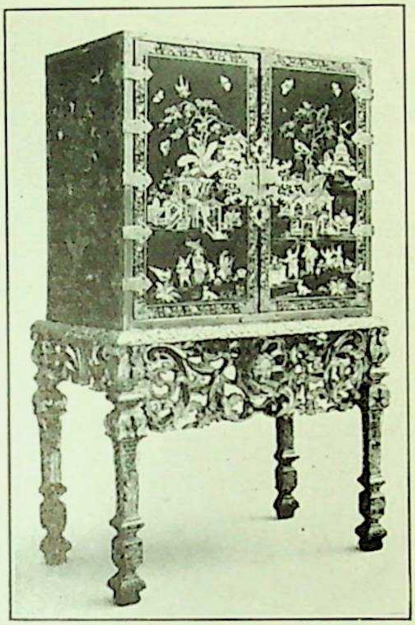
Plate XVII.—1. William and Mary Side Chair with Leather Seat and Hoof Feet. 2. William and Mary Trumpet-leg Highboy, Showing Ogival Apron and Ball Feet. 3. Double-hood William and Mary Secretary, Block Feet. 4. William and Mary Cane-back Chair, Showing "Saltire" Stretchers with Finial.

of light tables superseded the single ponderous refectory table of the Tudor age and, with double and roundabout chairs, grandfather clocks and mirrors, complete the interior picture.

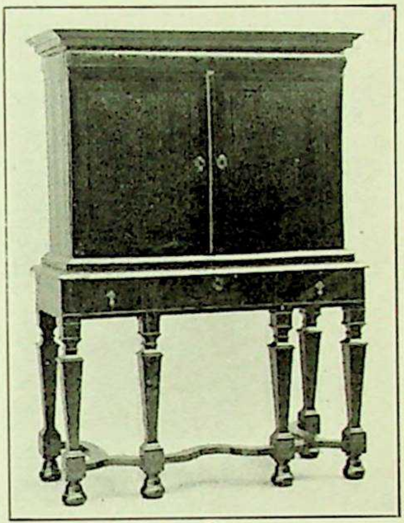
Few styles of furniture are easier to recognise than William and Mary; the bell or inverted cup turning on chair and table legs was but one of a number of adaptations imported from Holland along with the Dutch cabinet makers of William's preeminently Dutch household. Attributable to Mary's personal love of the art and to the industry of French Huguenot refugees was the increased wealth of "petit point" upholstery, fine needlework pictorially executed with many colored yarns. The double- or triple-backed settee was one of a number of upholstered pieces equipped with "squab" or movable cushions, narrowing toward the back.

Spiral turning and the ball or bun-shaped foot were carried over from the preceding period, connected by flat shaped "saltire" stretchers sometimes crossing in a curved X and surmounted at the intersection by a carved finial. Cabinet work was rectangular except for rounded single or double arches and aprons in more intricate ogival shapes. All lines were relatively simple, purity of contour being regarded as more desirable than lavish carving and decoration. Chair backs were straight, arched and filled with caning or open work carving; arms flared outward and legs were turned in trumpet, octagonal or cup and bell designs, later in the cabriole shape.

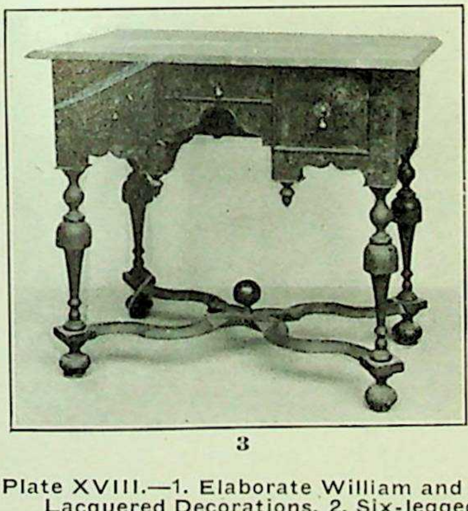
With this period the dominance of walnut approached its peak although the ever-popular English oak found continued use along with pine, cedar, chestnut and beech. As carving declined turning and marquetry increased in vogue, the latter on the front of cabinets in an elaborate form known as "seawood;" simpler patterns were executed with boxwood and holly. The oriental taste derived from Holland manifested itself in gold designs of Chinese origin on backgrounds of black, rich blue, red and green imitation lacquer work. Legs and stretchers of chairs and settees were sometimes gilded or painted, often to harmonize with upholstery colors, and veneers were laid on both oak and fir in plain and fancy markings. Metal cabinet fixtures consisted



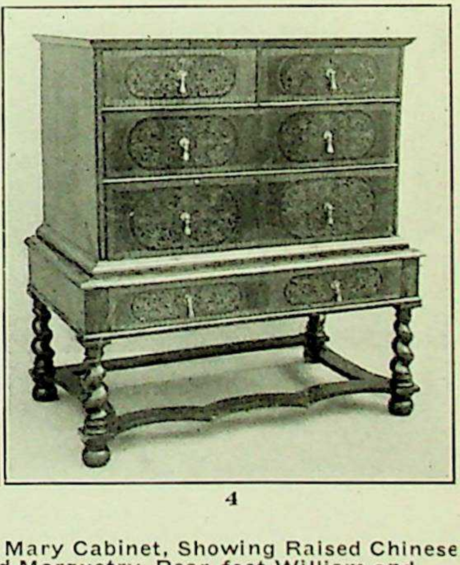
1



2



3



4

Plate XVIII.—1. Elaborate William and Mary Cabinet, Showing Raised Chinese Lacquered Decorations. 2. Six-legged Marquetry, Pear-foot William and Mary Cabinet. 3. William and Mary Side Table, Showing Marquetry and Cup and Ball Legs with Saltire Stretcher and Ball Finial. 4. William and Mary Chest, Showing Marquetry Insets and Spiral Legs.

of drop drawer pulls, perforated hinges and scrolled key plates.

William and Mary designs in modern furniture reached their greatest popularity in this country a few decades ago when it was extensively reproduced for every purpose. Except for the bedroom its simplicity renders unnecessary the adaptations required for so many of the older periods and makes it suitable for almost any type of interior. Today it is seen occasionally in radio and phonograph cabinets, carried out chiefly in walnut or mahogany, and in decorated oriental lacquered effects on secretary desks.

Original pieces were either waxed directly on the wood or rubbed with hot linseed oil; later, on fine veneered work, shellac was applied in thin coats, then wax-polished to a high lustre. Modern finishes call for water stain on mahogany of a shade somewhat deeper and browner than Adam, an oil stain of Jacobean shade on oak, and on walnut either oil or water stain of the shade known as antique. The filler should be of a color appropriate to the wood and the final finish duller in lustre for walnut and oak than for mahogany. The panels of walnut cabinet work may be lacquered in the oriental manner.

# CHAPTER IX

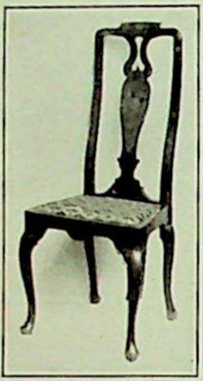
## QUEEN ANNE

### (THE DUTCH INFLUENCE AT ITS HEIGHT, 1702-1750)

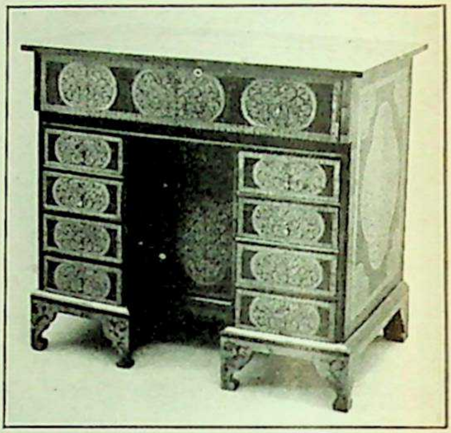
THE reign of Queen Anne was one of the shortest of any sovereign in English history—only twelve years—but the furniture style which bears her name was not only marked by a radical change from previous periods, but kept its popularity through the reigns of two succeeding monarchs, George I and George II. Moreover it was contemporaneous with the advent of more settled conditions in the American colonies, and as a natural consequence, much furniture which we prize as "Colonial," to an Englishman, would be pure "Queen Anne."

The period offers an exceptionally fine illustration of the many centuries required to develop a truly distinctive furniture style; for while accepted as a thing of English creation, Queen Anne proportions and flowing lines were imported from Holland, along with the retinue of William of Orange. The Dutch artisans, however, in their turn had merely observed and adapted forms introduced by traders returning from China where the characteristic Queen Anne cabriole leg had originated in animal forms of an almost forgotten antiquity.

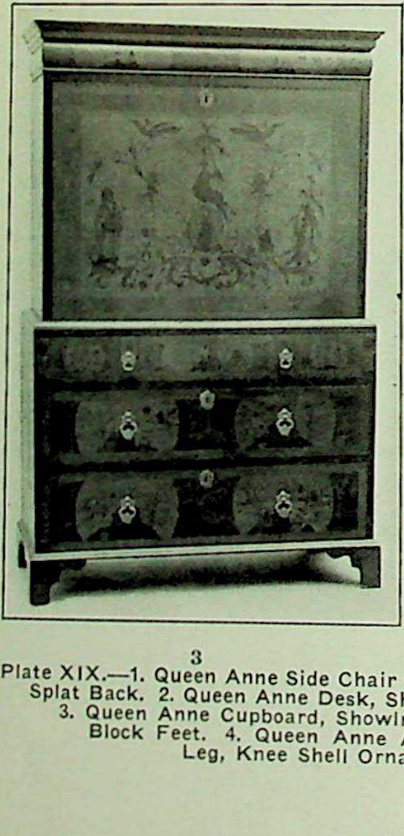
Furniture in England had by now become more and more diffused among all classes of the population; no longer did the noble lord sit on the raised dais, while merchants sat on benches and the peasant stood because he was supposed not to sit at all except in his own home and then only on a rude stool. Cabinet makers in the early eighteenth century flourished because their orders came not just from the wealthy few but from the more affluent in every class. The time of the modern furniture factory was still far off, but public taste was demanding greater variety and comfort in home furnishing than ever before.



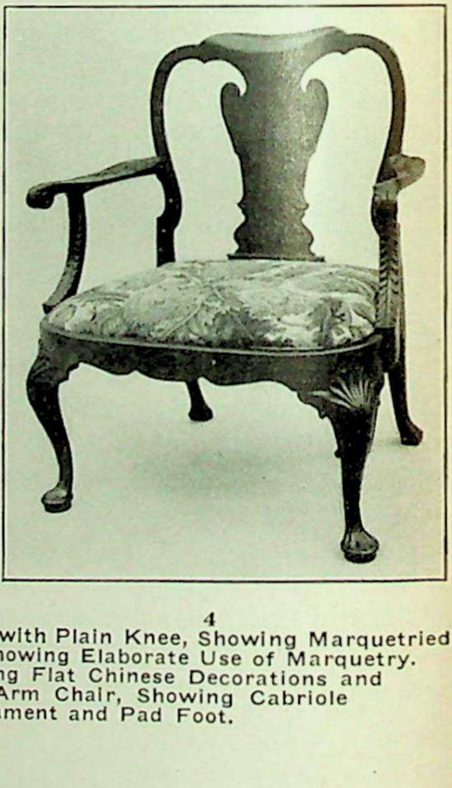
1



2



3



4

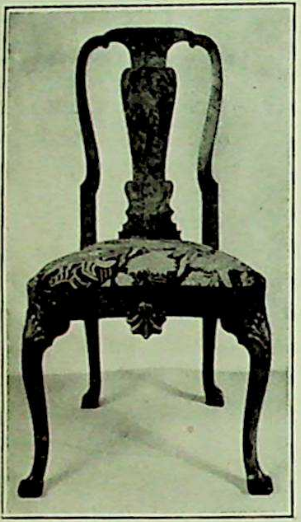
Plate XIX.—1. Queen Anne Side Chair with Plain Knee, Showing Marquetried Splat Back. 2. Queen Anne Desk, Showing Elaborate Use of Marquetry. 3. Queen Anne Cupboard, Showing Flat Chinese Decorations and Block Feet. 4. Queen Anne Arm Chair, Showing Cabriole Leg, Knee Shell Ornament and Pad Foot.

To the elaborate drop leaf table for the dining room were added the dished and pie-crust tilt top tripod varieties for the drawing room, and though bedsteads retained all four posts, the two rear ones were apt to be plain and the carved front ones were still more slender. Three-cornered cupboards came in, often circle-fronted in glass, the forerunner of our modern china cabinet. Highboys were further refined and the lowboy was employed as the counterpart of our own modern dressing table just as chests of drawers functioned as bureaus though still divided one half into cabinet and only the rest into drawers. Upholstery became more noticeable both in chairs and settees, but with the then novelty of wing sides to ward off drafts.

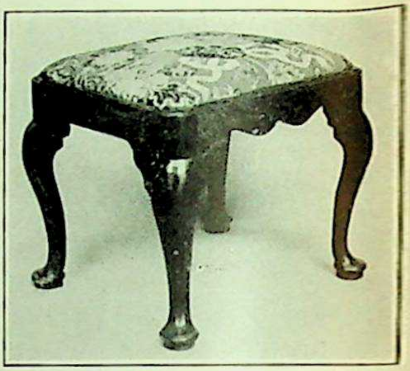
Hitherto English furniture had been marked by severe, geometrical lines and a general sturdiness that relied on color or carving to give it artistic interest. The Queen Anne period changed all of this by introducing a form of beauty based on graceful, flowing contours—curves in place of rectangles. Most notable is the cabriole leg and the claw and ball foot, the latter a Chinese motif presumed to represent the dragon grasping the mystic jewel.

Stretchers, formerly deemed a necessary element of sound construction, disappeared with advanced knowledge of joining and dovetailing. About all that remained of carving was the conventionalized scallop shell often mounted on the knee of the cabriole leg, and turning, too, went out of fashion. Cupboard tops remained architectural with broken curves and classic vase finials set in the breaches. Chair feet, in addition to the ball and claw, also included the club, Spanish, hoof, pointed and paw types.

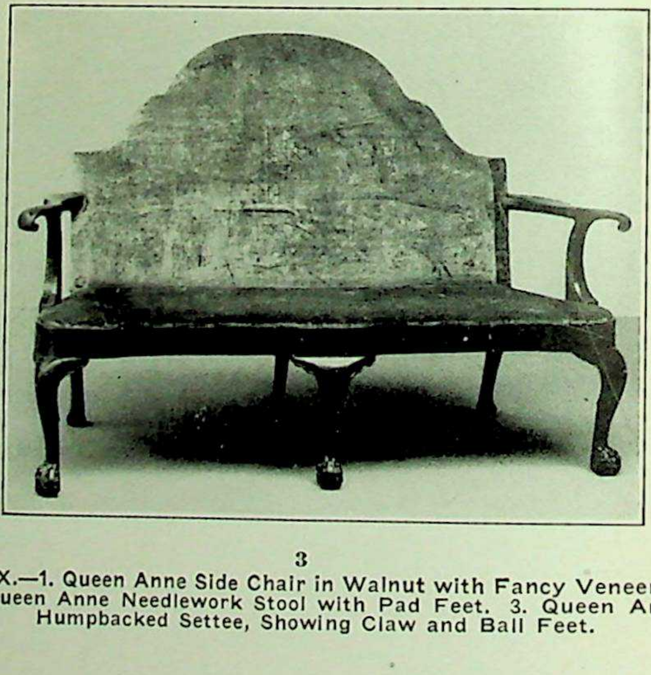
Chair seats flared and were made wider than previously to accommodate the voluminous, spreading feminine costumes of the time. Chair backs were curved at the top and bent back to a more comfortable shape and generally became lower and less ornate, the simple-pierced splat and fiddle designs being favored. The scallop shell was not confined to chairs but appeared also on aprons of tables and drawer fronts. It is interesting to note that during the period there was invented by an obscure maker of



1



2



3

Plate XX.—1. Queen Anne Side Chair in Walnut with Fancy Veneer Splat. 2. Queen Anne Needlework Stool with Pad Feet. 3. Queen Anne Humpbacked Settee, Showing Claw and Ball Feet.

wagon wheels, a chair which has never lost its popularity throughout all the vagaries of style—the Windsor.

Because tradition for some time had dictated walnut for all fine furniture, Queen Anne at first was executed almost entirely in this wood, but with the abandonment of the carving to which walnut so readily lends itself and the lowering of a prohibitive tariff barrier, mahogany sprang into popularity, and from about 1733 was increasingly used. Oak still was favored in the rural districts, however, and some pine, pear and chestnut was employed as a ground work for veneering, gilding and lacquering. Both walnut and mahogany were used, now in solid, now in veneer form, according to the skill and custom of the individual cabinet maker.

Painting was still practiced in black or pastel shades of cream, blue and green, generously hand-painted in conventional floral designs. The popularity of gilt in France was reflected in England by applying it to individual ornaments like the scallop shell rather than as a complete finish except on cabinet bases. Veneers selected for figure were applied to splat chair-backs, cabinet panels and drawer fronts; marquetry and inlay fell into disuse, but imitations of oriental lacquer work became still more elaborately pictorial, appearing on chairs and tables as well as cabinets.

Queen Anne design has probably been the most consistently popular of all American furniture styles having their basis in original historical periods. Like the monarch who gave it a name, it is essentially domestic, and regardless of the vogue of the moment, is sold year in and year out in a wide variety of forms. It does not require an elaborate background, it is easy to care for, and lends itself alike to the simplest and most colorful finish treatments without becoming tiresome.

The finish for modern reproductions is the same as for William and Mary save that the mahogany may be stained somewhat redder and the walnut lighter. In its simple forms it is difficult to differentiate from much American Colonial for which it afforded a very pronounced inspiration.

# CHAPTER X

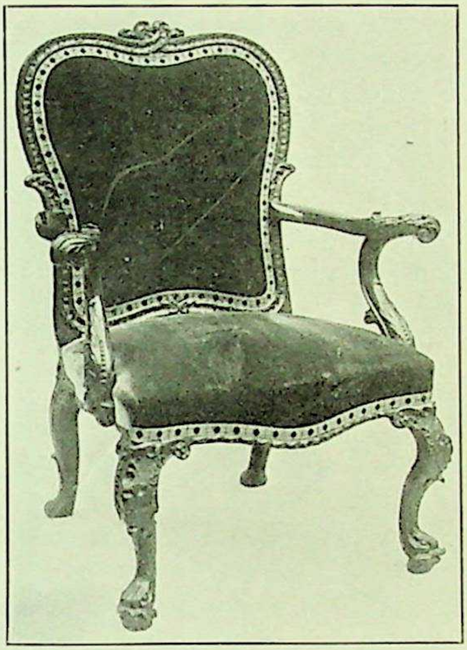
## CHIPPENDALE

### (THE GEORGIAN PERIOD, 1750-1830)

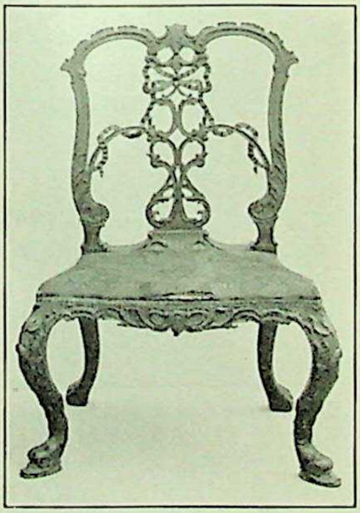
THE Georgian Period covers the greater part of the eighteenth century and part of the nineteenth, comprising in a furniture sense the creative work of a series of distinguished cabinet makers, designers, architects and interior decorators who flourished more or less contemporaneously under the four Georges, English kings whose reigns extended from 1714 to 1830. The consequent competition led to an artistic rivalry, culminating in what is recognized as the Golden Age of English furniture. The early part of this period, 1714-1750, is frequently referred to as Early Georgian.

The first of these renowned furniture builders was Thomas Chippendale, who came to London with his father in 1727. He soon showed originality and in 1754 published a book of designs, "The Gentleman and Cabinet Maker's Directory." The first furniture catalog ever issued, it sold for the then unprecedented price of $16.00 and was eagerly subscribed for by cabinet makers and aristocracy alike. From then on the fame of Chippendale was established.

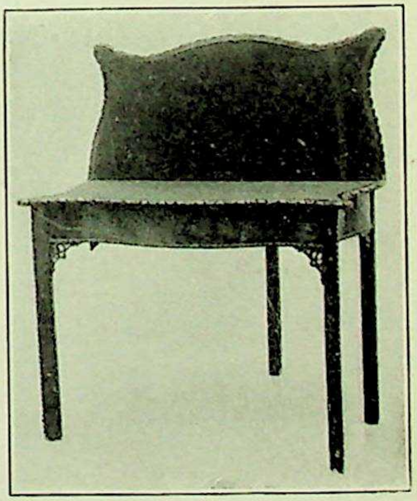
Chippendale is best known for his chairs, of which he originated a number of distinctive types, but he also built (for he was a manufacturing artisan as well as a designer) beds, secretaries, desks, tables, cabinets, sideboards, sofas, bureaus, dressing tables —in fact, nearly all modern forms. One of his state bedsteads is a marvel of massive yet delicate beauty in its perfectly balanced proportions. Genuine Chippendale furniture today is extremely rare despite the profusion of pieces executed in his shops.



1



2



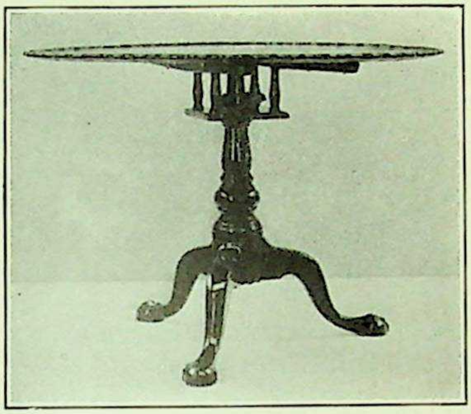
3

Plate XXI.—1. Chippendale Upholstered Armchair, Showing Dolphin Feet. 2. Chippendale Ribband-back Chair, Showing Cabriole Leg and Dolphin Feet. 3. Chippendale Drop-leaf Side Table, Chinese Style.

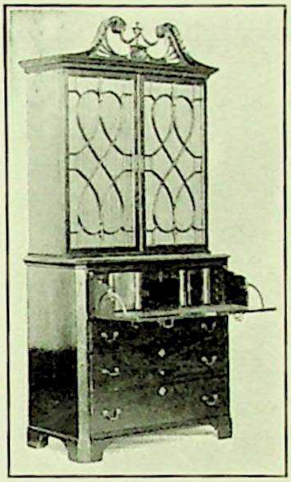
Chippendale's furniture was not only structurally sound but carried still further the tendency toward lightness and grace started under William and Mary, and in his great versatility he sought inspiration from many different sources. He continued in his English models to employ the Queen Anne ball and claw foot, the cabriole leg and club, scroll and hoof foot. Gothic influence is shown in the quatrefoil and trefoil and in a variety of adapted geometrical forms. From France he borrowed rococo of Louis XV and later, when the world of fashion went mad over a book of Chinese architectural designs by Sir William Chambers, he introduced pagoda cabinet tops and square fretted legs and table aprons.

It is therefore necessary to differentiate rather sharply between purely English, French, Gothic and Chinese Chippendale, although motifs of the two latter were often so mingled as to be undistinguishable. Cupboards, secretaries, settees, bureaus and dressing tables were apt to be English, bedsteads French, tables Chinese or Gothic, and chairs any one of the four. One of the most distinctive Chippendale designs is known as the "ribband" back chair, the carved splat of which shows a knotted ribbon with four loops. All Chippendale chairs show strong evidence of consideration for comfort, the seats being square cornered, well upholstered, of adequate size and tapering straight toward the back. The top rails were either square, arched or serpentine, meeting uprights that flared outward on each side—an effect of singular beauty.

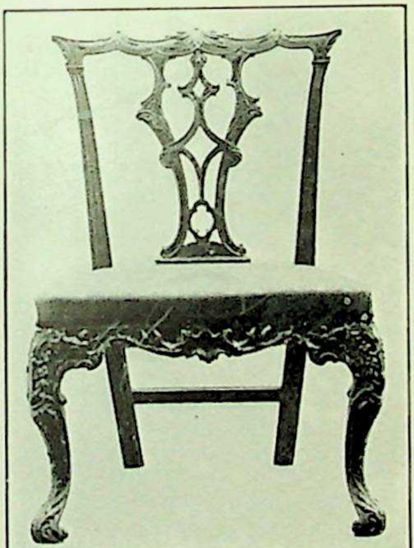
In 1733, about the time Chippendale was starting on his career, the British prime minister, Walpole, removed the duty on the importation of mahogany logs. The use of this wood immediately became widespread among cabinet makers and its great flexibility so appealed to Chippendale's passion for carving that he employed it almost to the exclusion of all else. Carving was practically his sole form of ornamentation—turning was used but little, and inlay never. Varicolored lacquer work on cabinets, gilding and marquetry disappeared and upholstery, while generous, included fabrics in more restrained designs than hitherto.



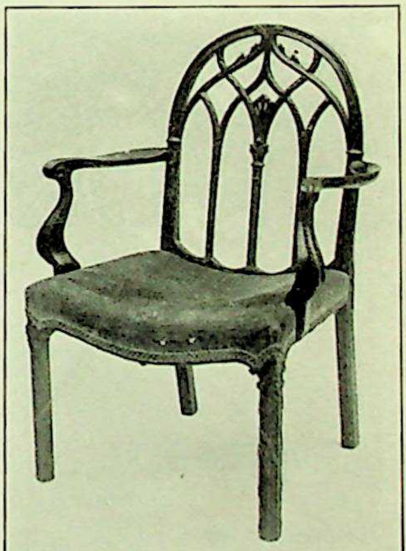
1



2



3



4

Plate XXII.—1. Chippendale Tilt-top Piecrust Table with Claw and Ball Feet. 2. Chippendale Secretary, Showing Drop-front and Block Feet. 3. Chippendale Scroll-foot Chair, Showing Mingling of Chinese, Gothic, Queen Anne and French Styles. 4. Chippendale Armchair, Gothic Style.

Modern furniture of Chippendale inspiration requires relatively few adaptations because little improvement can be made even in the light of present day standards of comfort and practicability. As Chinese is too exotic and Gothic rather too ecclesiastical, the popular forms run chiefly to English and French for the dining and living room. There they express dignity and refinement—a happy compromise between the inanimate simplicity or pompous formality of other periods. The wood in all cases customarily is mahogany.

The cabinet makers of Chippendale's time finished their work on the bare wood by the French polishing method. A soft rag was rolled into a ball and dipped into linseed oil, then covered with another layer to which was applied shellac and gum arabic and rubbed on the surface with a circular motion. As soon as one coat dried a second treatment followed, repeated until the pores were filled level and a brilliant lustre obtained. The method while effective, is extremely tedious and hence utterly unsuited to modern production requirements.

Today we attempt with water stains to duplicate the deeper tones taken on by long mellowed originals. Any shade approximating Adam brown will serve, followed by red or brown filler and a clear lacquer or pale varnish finish rubbed to a soft eggshell. High-lighting, shading or antiquing of any sort is inappropriate.

# CHAPTER XI

## HEPPLEWHITE

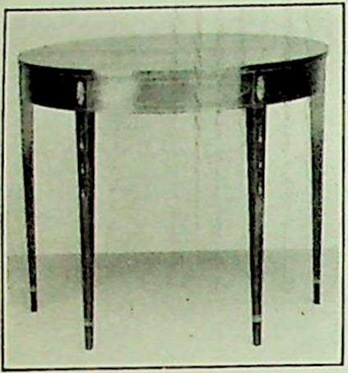
## (THE GEORGIAN PERIOD, 1750-1830)

HEPPLEWHITE was another of the eminent furniture designers and cabinet makers or "joyners," as they were then apt to be termed, who attained distinction under the Georges. It is not certain when Hepplewhite was born, but his death occurred probably in 1786. For the ten years prior to this, contemporaneous with the American Revolution, his style enjoyed a tremendous vogue among British people of wealth.

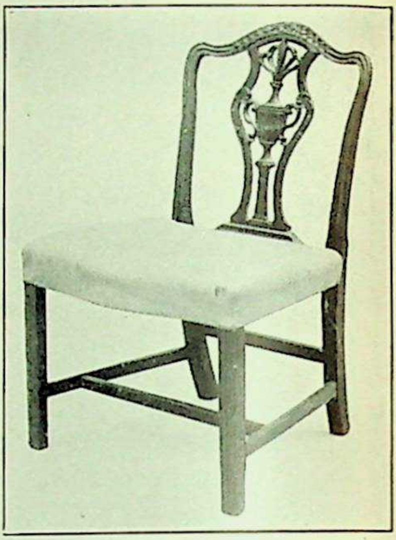
But while his name was the fashion, we know nothing of him personally except as we can reconstruct him from his creations. They were widely copied—many cabinet makers now flourished in England and these artisans eagerly sought for models brought out by those of their craft who, like Hepplewhite, were marked by genius. Moreover there were no patent laws in those days and Hepplewhite, unlike some of his equally distinguished fellow designers, did not think it worth while to publish ominous but empty warnings.

After his death, his wife Alice carried on the business under the name of A. Hepplewhite & Company, and following the example set by Chippendale, published a book of her husband's designs in 1788. Some 300 were shown, many of which were original and still others of which were either uninteresting or else showed marked influence on the part of his contemporaries and of the French Louis XVI school then flourishing across the channel.

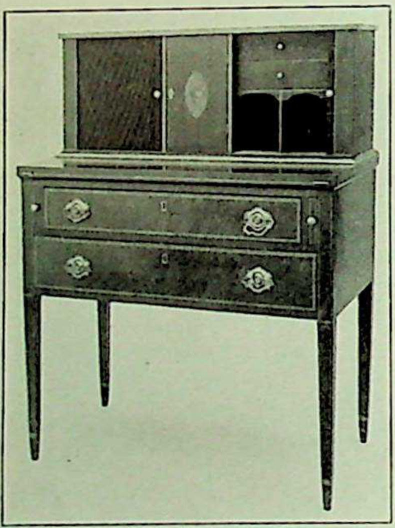
Hepplewhite produced practically all of the pieces with which we are familiar in every day life. His chairs show the greatest variety, but there was also a profusion of tables for all purposes —drop-leaf with one oval and one square end, two of which



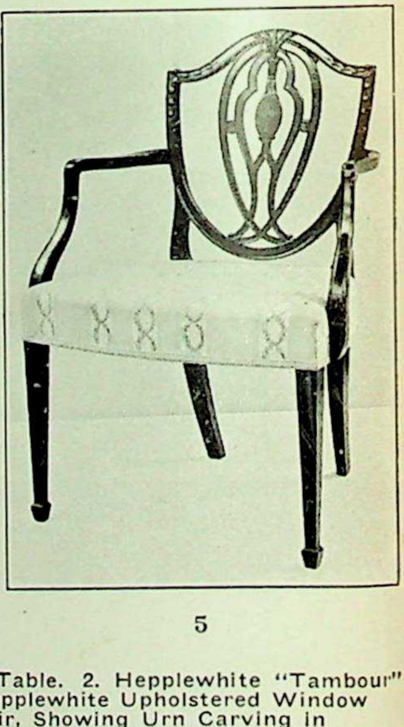
1



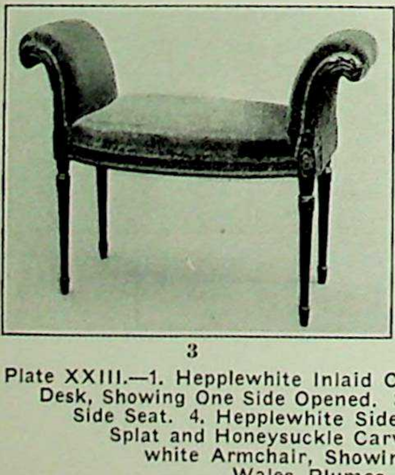
4



2



5



3

Plate XXIII.—1. Hepplewhite Inlaid Card Table. 2. Hepplewhite "Tambour" Desk, Showing One Side Opened. 3. Hepplewhite Upholstered Window Side Seat. 4. Hepplewhite Side-chair, Showing Urn Carving in Splat and Honeysuckle Carving on Top Rail. 5. Hepplewhite Armchair, Showing Shield-back, Prince of Wales Plumes and Spade Feet.

might be joined to form a long table; Pembroke tables, washstands, console tables, many of them with delicately inlaid tops and slender tapering reeded or fluted legs.

Of a number of innovations occurring in his time might be cited the decline of the once popular high and lowboys in favor of chests of drawers on the order of our modern chiffoniers. Stools, too, disappeared and the dressing table was redesigned to permit the lady to sit closer to the mirror. Bureaus, chests of drawers, sideboards and book cases were provided with an undulating or serpentine front, sometimes applied only to the centre section, the end parts cut concave. The tambour desk has a drop front with pull out bars on either side to support it.

Hepplewhite's chairs, which were his hobby, are characterized by backs of rare beauty in heart, hoop, shield, oval and lyre shapes. The emblem most closely associated with him, the Prince of Wales plume, three feathers arising and spreading from a ring, was frequently carved in the centre. Slightly flaring arms surmount upholstered seats which taper or curve gently to the back. Legs are generally square tapering down to ankled spade feet. The Dutchess chair, a novelty of the time, consists of two joined armchairs, one faced reverse from the other.

Hepplewhite is a blend of designs. He borrowed the classic impartially from Louis XVI patterns and from the Adam Brothers, many of whose commissions he executed and incidentally made practical. For Hepplewhite was English to the core and favored neither the curve to the extent of Chippendale nor the straight line to the extent of Sheraton. In short he achieved lightness, grace and appealing outline, but never at the sacrifice of sturdiness.

Like his contemporaries he favored mahogany, invariably employing it where carving was part of the scheme. Nevertheless he was a pioneer with many lighter woods, notably sycamore for fancy veneering, tulipwood, ebony, rosewood and white holly for inlay and division lines, and satinwood as a base for the beautiful decorative hand painting of Angelica Kauffman and Italian artists. Sideboards and desks were embellished with small carved rosettes, medallions and festoons, ivory keyplates and brass ring pulls, all employed with the greatest restraint. Lacquering on secretary desks was still practiced to some extent, but the Chinese vogue was on the wane.

Like most of the Georgian styles, Hepplewhite has a universal appeal that is not affected by passing popular fancy. It is suitable for the bedroom as well as dining and living rooms and may be turned out in walnut or mahogany as simply or as elaborately as desired—the purity of the lines is always there. Walnut should be stained the antique shade—otherwise the finish is the same as for Chippendale.

# CHAPTER XII

## THE ADAM BROTHERS

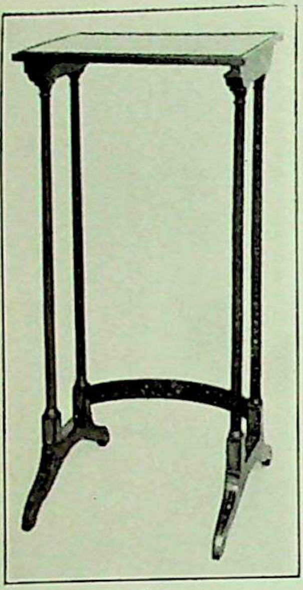
### (THE GEORGIAN PERIOD, 1750-1830)

THE excavation during the middle of the eighteenth century of the twin Roman cities of Herculaneum and Pompeii, buried under volcanic lava and ashes since the year 79, aroused world-wide interest in classical architecture and interior decoration. Among the thousands who journeyed thither to supplement theory with first-hand acquaintanceship were Robert and James Adam, who with two other brothers formed a rising firm of architects in London.

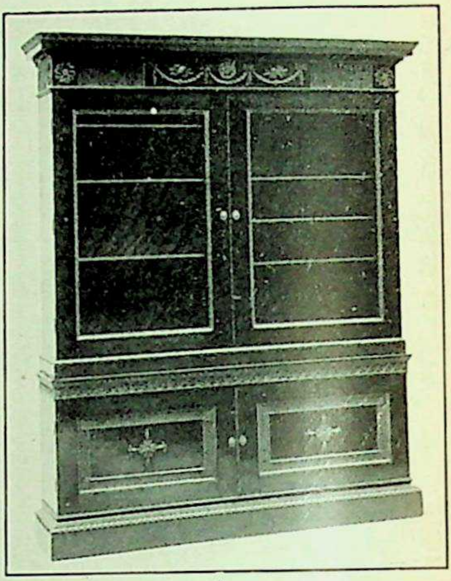
The Adelphi, as they were called, returned strongly imbued with the classic spirit and in time received commissions for some of the most notable public and private buildings in the city. In 1762, Robert, the leader among the four, was appointed architect to King George III, and it is to him rather than to the others that the distinctive Adam style is attributed, although James was at all times his active and helpful assistant.

To both brothers detail was all important, and as nothing at that time existed which would harmonize with their wholly individual ideas, they did not stop with the building alone, but took care of its interior decoration and furnishing as well. It is said that they once went so far as to make a special design for a pair of silver salt cellars for no other purpose than to make sure of preserving the unity of a certain dining room scheme. So far as furniture went, however, they remained designers pure and simple, the actual work being executed by such practical cabinet makers as Chippendale and Hepplewhite.

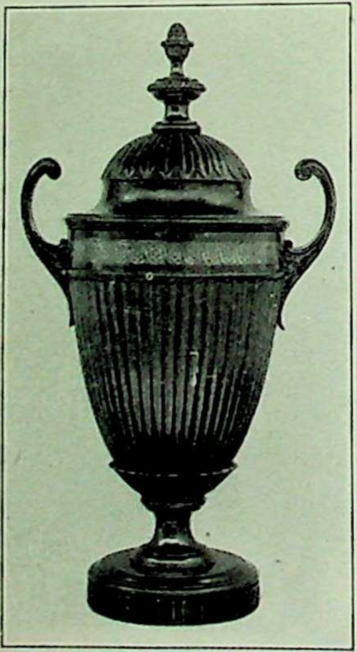
While the Adam Brothers designed practically all modern forms, including chairs, stools, settees, chests of drawers, consoles, secretaries, etc., their most significant works were those



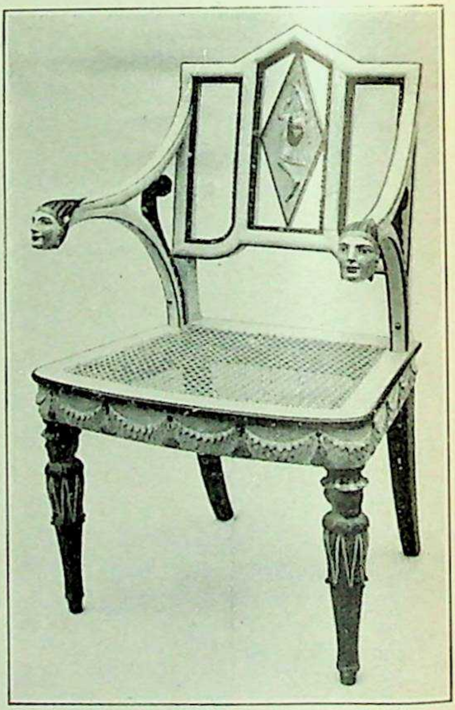
1



2



3



4

Plate XXIV.—1. One of a Nest of Tables, Adam Style. 2. Adam Bookcase, Showing Architectural Outline and Classical Decorations. 3. Adam Sideboard Knife Urn of Classical Design. 4. Adam Cane Seat Armchair, Painted and Polychromed.

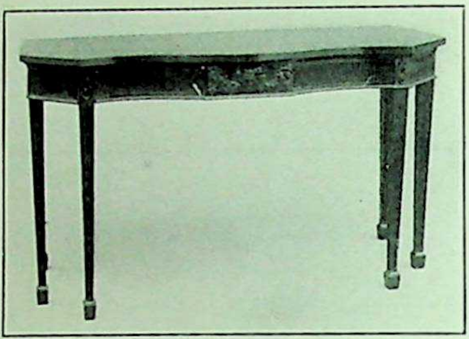
permitting the widest scope for architectural treatment, such as bookcases, cabinets, sideboards and window seats. As interior decorators it was their policy to make their furniture individual to the room for which it was intended, the forerunner of our modern production in "suites." Adam bedsteads are rare—these elaborate canopied articles dear to our ancestors for centuries were already on the decline. The console table on the other hand was practically an Adam invention—at all events they gave it popularity.

As previously indicated, the classic note dominates and pervades the Adam style, architecturally in outline and ornamentally in detail. As an example of the former may be cited a typical sideboard with its massive end cabinets surmounted by knife case urns, the grooved columns supporting a console or the sturdy proportions and studied cornices of a bookcase. The hand of the architect is noticeable everywhere in hexagons, ovals, octagons and tapering columns, many of which are but miniatures of what we see today on the facade of almost any fine public building.

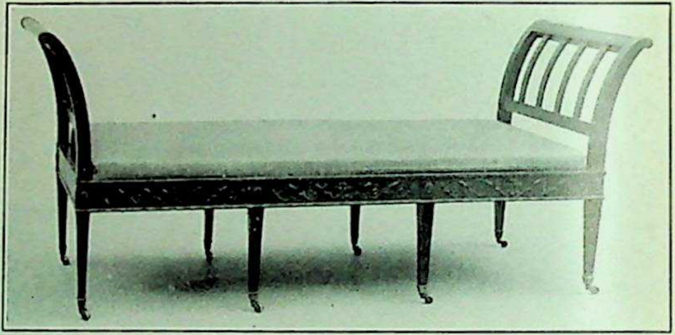
As a general thing straight lines were preferred to curves, the exceptions occurring in oval and square scrolled chair backs and on consoles and side tables with swelled or "bombe" fronts. Chair legs were apt to be round, fluted and tapering in the front, flaring and square in the back; table legs were more likely to be square, slightly less tapering and ending in spade block feet. Tables show four or six legs; day beds as high as eight, frequently mounted with rosettes carved in flat relief.

Perhaps the most characteristic example of Adam design is embodied in the side board. Two massive pedestal cabinets are joined to a curve fronted center piece supported by four tapering square legs and composed of two large and three small drawers flanked in turn by two smaller cabinets. Brass rails run around the top at the back and large knife cases in the classic urn design surmount the pedestal cabinets. The whole appears to be made up of three distinct sections and is freely but not excessively ornamented.

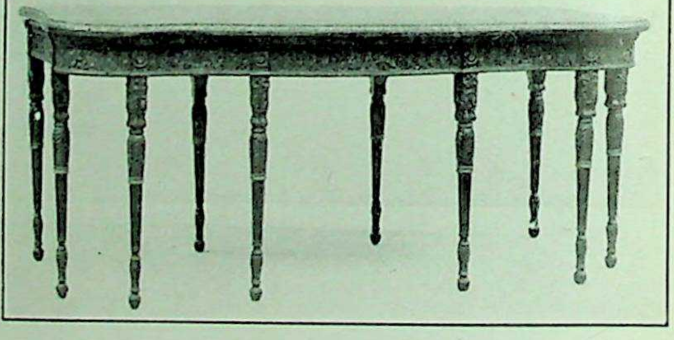
Most Adam decorations were carved in low relief, small and



1



2



3

Plate XXV.—1. Adam Serpentine Front Console Table, Showing Fluted Apron and Six Legs. 2. Adam Eight-legged Daybed. 3. Adam Sideboard, Showing Rosette Carvings at Leg Tops.

extremely refined in detail. Ordinarily carving was executed in wood and then applied, but for very delicate work, composition was used. These details took the form variously of egg and dart moulding, loops and festoons of ribbons and leaves, oval and round sun bursts, vases, wreaths, the acanthus, the honeysuckle, masques and beaded moulding.

As with others of the same period, mahogany was the favorite wood, but the Adam Brothers gave considerably more attention to the matching of figured veneers. Satinwood, however, ran mahogany a close second and was often used for the entire piece and not just for inlay purposes like holly, ebony, tulip and similar tropical woods. It was particularly favored as a base for decorative panel painting, the work being executed by imported Italian artists, but where painting took the form of a complete finish, pine and lime were preferred as being cheaper. Natural sycamore was employed for some pieces; when chemically stained to a delicate green color it was known as "hare wood." Gilding was practiced over a base of white or green paint and some marquetry was applied to chairs, table tops and cabinet fronts.

Adam designs today are executed chiefly for the dining and bed room, being turned out in walnut and enamel as well as mahogany. It may be greatly simplified without altogether impairing the charm of its classic purity and decoratively is a less pretentious edition of Louis XVI. Both styles require more attention to harmony of background and auxiliary furnishings than Queen Anne or William and Mary, belonging rather to the city than the country or suburban home.

The stain color for modern reproductions in mahogany has become standard under the name of this period; the remainder of the finish and that for walnut is the same as for Chippendale and Hepplewhite. When finished in enamel, pastel shades of green, blue and gray should be preferred as Adam colors; decoration may comprise anything of a classical nature.

# CHAPTER XIII

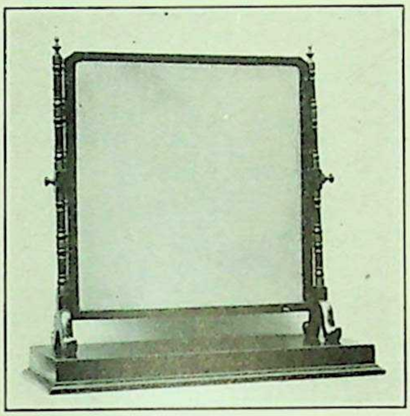
## SHERATON

## (THE GEORGIAN PERIOD, 1750-1830)

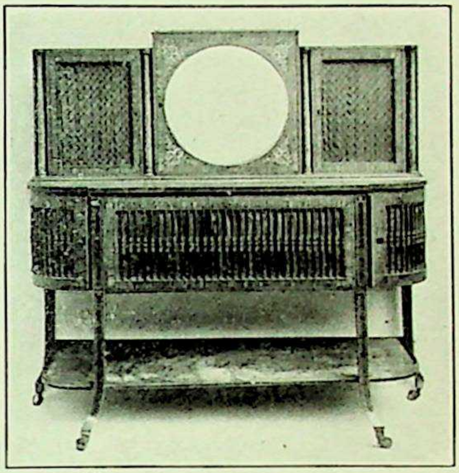
THE last of the outstanding furniture designers flourishing under the four Georges was Thomas Sheraton. A poor provincial cabinet maker, he repaired in 1790 to London hoping there to find the fortune he could never hope to attain at home. It was not long before the realization came that without further education hope of advancement was futile, and eking out his living as a preacher and teacher of drawing, he applied himself to the study of design and mechanics.

During the last decade of the eighteenth century and early in the nineteenth, when Sheraton's genius reached its flower, the later George IV was Prince of Wales, Beau Brummel was dictator of fashion, and the French and American Revolutions had successfully terminated. After Sheraton the world of English furniture produced nothing but uninspired imitations of French Empire at its worst, followed by dreary Eastlake and finally Art Nouveau, the European counterpart of our own Mission.

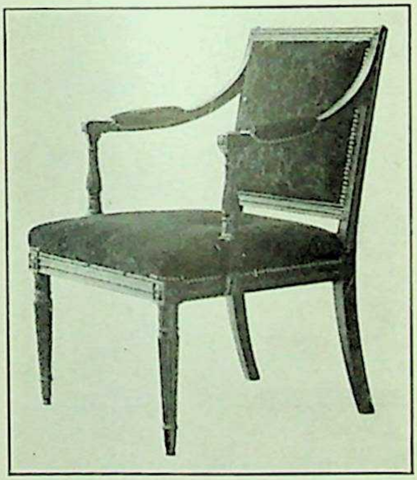
Owing to his mechanical bent, Sheraton was looked upon in his day as something of an inventor. In his cabinet work he introduced secret drawers and compartments with springs, roll tops for desks and all sorts of ingenious folding furniture—wash stands and other bedroom pieces convertible into bookcases and writing tables. In his hey-day he received commissions for whole apartments and their furnishings from the Prince of Wales and many of the nobility. But with all this, Sheraton's impractical qualities so persistently asserted themselves that, though he endeavored to follow a changed popular taste, he died in poverty.



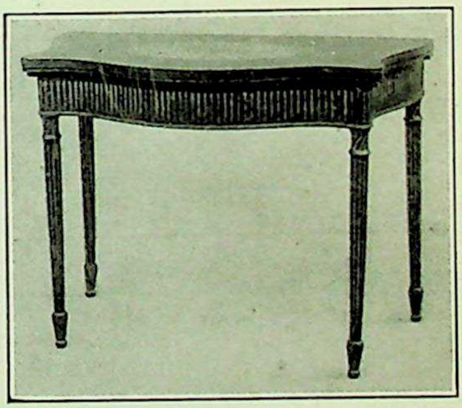
1



2



3



4

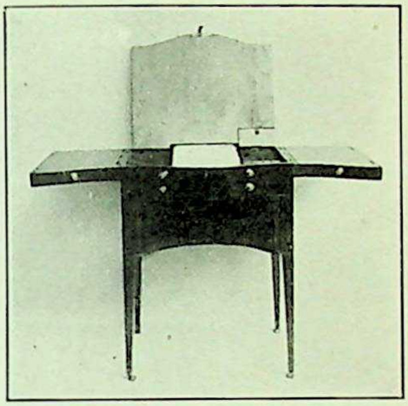
Plate XXVI.—1. Sheraton Adjustable Dressing Glass. 2. Shearer Inlaid Cabinet with Grilled Front and Looking-glass at Top. 3. Sheraton Upholstered Armchair. 4. Sheraton Inlaid Card Table, Showing Serpentine Front.

In his "Cabinet Maker and Upholsterer's Drawing Book," published in 1791, Sheraton proves his title as the "chaste designer" and demonstrates his talent for working severe lines into furniture of graceful elegance. Its extreme slenderness was inspired partly by the classicism of Louis XVI and partly by a real or feigned contempt for the work of his contemporaries. But from one of these, Shearer, his work is difficult to distinguish, for both were not only lovers of lightness and beautiful contours, but of sound construction as well. Thus many of their originals still survive in good condition where styles of sturdier appearance have not.

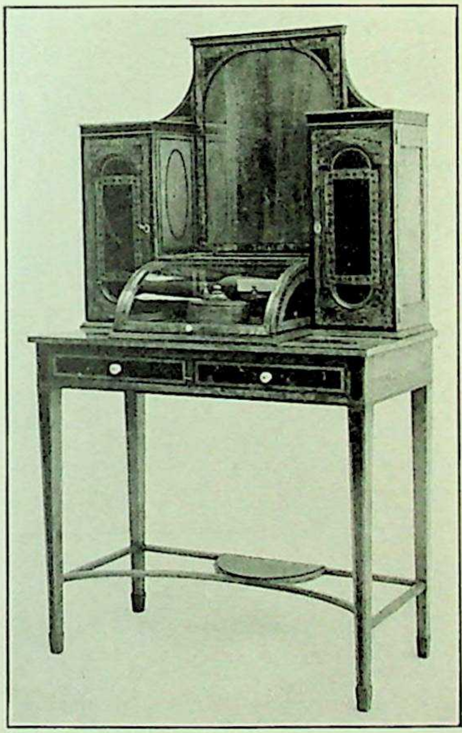
Sheraton's chairs most forcefully illustrate his happy commingling of delicacy with strength. The backs are gently raked and square, filled in over a straight cross bar with lattice work, plain splats, a lyre or an urn, the top line straight or slightly broken. Slender fluted legs in round or square forms tapered straight down to natural or spade feet and arms, where not straight, curved continuously from back to front supports. Upholstery differed from that of Hepplewhite in that it reveals the frame instead of being pulled over it. Caning was largely used, alone and with pierced panels on settees.

Where Hepplewhite and Shearer gave to their sideboards a serpentine front, Sheraton preferred a complete convex or a single swelling set between square ends. The back often included a brass railing after the style of the Adam Brothers and the interior was filled with all sorts of small drawers, shelves, boxes, etc. Innumerable card tables, kidney-shaped desks, sectional bookcases, the clothes press and wardrobe for the bedroom complete the roll of distinctive Sheraton creations.

Although Sheraton favored satinwood, he employed mahogany extensively in his chairs and as feathered and fiddle back veneers on some cabinet work. Carving was used with the utmost restraint—chiefly smaller Adam forms such as urns, vases, sunbursts and rosettes. Ivory and brass key plates and metal drawer pulls were of the simplest design. Sheraton's favorite mode of decoration was inlay wherein his skill has never been surpassed. Kingwood, tulip, rosewood and holly were the chief



1



2

Plate XXVII.—1. Sheraton Folding Washstand. 2. Sheraton Gentleman's Dressing Table.

mediums which he often placed between narrow lines of ebony producing an effect of rare beauty.

Twentieth century reproductions are available chiefly for the dining room and bedroom, where they strike a note of genuine refinement, and it is perhaps a reflection on our age that they are not more popular. In the drawing room the vogue of "over-stuffed" has relegated Sheraton pieces to the background as nests of tables and smaller desks. They harmonize here with delicately figured wallpaper and soft toned hangings, but not with curvilinear or massive furniture.

In his book Sheraton was the first to give detailed instructions for the finishing operation which consisted in brief of the familiar French polish. He recommended that occasionally a little solution of "alkanet root" be added to the pouch in order to impart a reddish tone to the finish—the nearest approach in that age to our present-day wood staining practices, so often, alas, overdone. The modern practice is either not to stain at all, relying on wood filler to provide the necessary coloring or else employ a very weak solution, one or two ounces to the gallon of equal parts brown and red aniline powders. If desired the brown may be allowed to predominate, the final finish being preferably lacquer, polished rather than left in a dull rub. Satinwood may be toned with aniline solutions if it cannot be left natural; inlay is merely shellaced.

## CHAPTER XIV

## LOUIS XIV

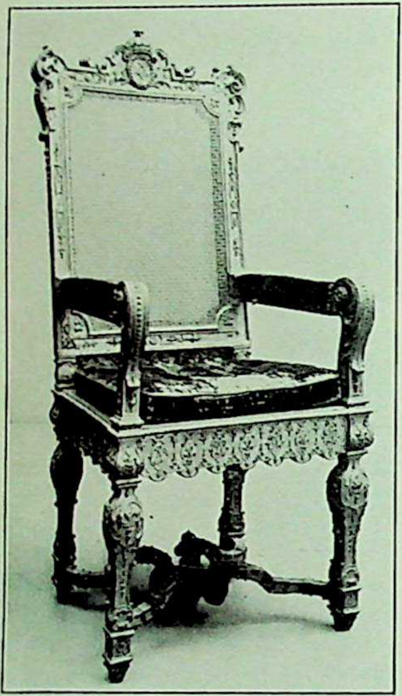
### (THE REGAL PERIOD, 1643-1715)

THE Renaissance in France reached the peak of artistic perfection under Francis I from which it is often known to connoisseurs as Francois Premier. The arts languished during the constant strife which marked the reigns of his successors—under Louis XIII occurred a period of transition during which the feudal system gave way to the consolidation of all power in the person of the king.

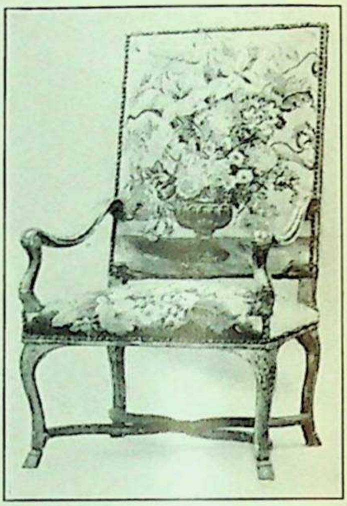
Louis XIV ascended the throne as a child and before his death, seventy-two years later, attained his ambition to shine in the eyes of the world as the most magnificent and powerful monarch of all ages. Hundreds of millions of dollars were spent in building the vast palace of Versailles, and on its completion, four thousand courtiers helped to make it the center of European luxury and fashion.

Colbert, the Sun King's minister of finance, gathered artisans from every country in the world and founded a royal manufactury of furniture, tapestry, painted and carved woodwork. Yet Louis XIV as a style was not the result of a royal command as with French Empire—it was the natural creation of a time when everything in France was keyed to the royal wish. Hence the Grand Monarch did not have to issue orders, for his every desire was anticipated, and like every other courtier, the artist Le Brun studied the prince whose smile meant wealth, whose frown could banish, and produced plans he well knew would please.

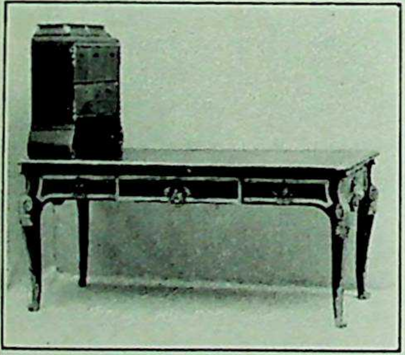
If the furniture of the period was ornate, it was because Louis XIV revelled in gold and glitter. But Louis was also a



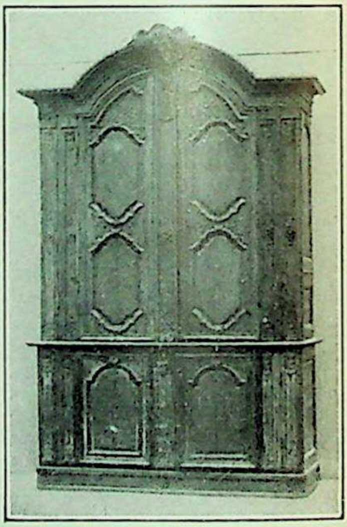
1



2



3



4

Plate XXVIII.—1. Louis XIV Armchair, Showing Saltire Stretcher, Cane Back and Leather Seat. 2. Louis XIV Tapestry Armchair, Showing Hoof Feet. 3. Louis XIV Cabinet-desk, Showing Boule Work Mounts. 4. Louis XIV Carved Armoire.

Bourbon, conscious of his heritage, so the style also spoke a dignity verging on austerity. In the first half of his reign he followed his armies and the observant Le Brun made his furniture tall, stiff and pompous. Later when he wearied of war a more graceful note was hastily introduced.

The forms included most of those with which we are familiar today although at this time the bureau was still a desk and continued so until the Empire period when it became a chest of drawers for the bedroom. Cabinets, bedsteads, tables, consoles and armories continued to be designed along architectural Renaissance lines, but with embellishments which caused them to breathe a new spirit of luxury. Sofas, chairs and stools round out the list of essential furniture.

The chairs of the period were large and fairly comfortable with saltire stretchers, square pedestal or gently curved legs with leaf knee ornaments and scroll, hoof or dolphin feet. Backs were broad and either pictorially upholstered or filled in with an oval pad framed by posts and intricate carving. Arms, at first straight and parallel, later shaped, carved and flaring outward, surmounted ample seats with or without aprons. Construction was solid after the Renaissance method but with an increasing note of lightness.

Oak and chestnut yielded to walnut as the new barocque style of carving (irregular twisting) superseded or mingled with such classical forms as the acanthus, lion, eagle, griffin, sunburst, vases, festoons, etc. Much gilding was practiced on a base of cheaper woods like cherry to harmonize the furniture with white and gold interiors. On chairs and sofas Gobelin and Beauvais tapestries vied with Lyons velvet, brocades, hand-painted damasks and caning.

Inlay, aside from conventional work with ebony and rosewood, was made notable by one André Charles Boule whose name is often erroneously spelled Buhl. This French cabinet maker devised a new fashion of veneering whereby a thin sheet of tortoise shell was inlayed in pictorial and arabesque designs with ivory, enamel, porcelains or brass. The process was later varied by inlaying with mother of pearl and silver over ebony and enriched by applying brass mountings to feet, corners and edges.

Modern Louis Quatorze furniture is limited in popularity by the fact that its stately grandeur requires spaciousness, high ceilings and luxurious surroundings, such as are afforded by pretentious city mansions, hotels and clubs. It may nevertheless be adapted to some extent for the dining room or hall in smaller homes and apartments and is available for this purpose both in walnut and mahogany, usually without the extensive carving peculiar to the original style.

The walnut, where stained at all, is given a weak solution of walnut crystals, filled with natural or very light walnut filler and two or three coats of lacquer, dull rubbed. A thin finish film is to be desired and ornaments if desired may be high-lighted with pale gold bronze. Mahogany is given the standard Adam brown finish, dull rubbed and only very delicately shaded if at all. Both finishes call for extra attention to fine veneer figures, ordinarily of the diamond pencil-stripe variety.

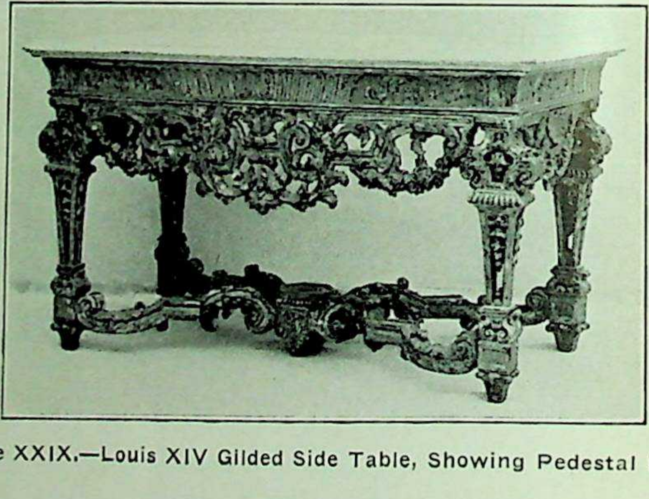


Plate XXIX.—Louis XIV Gilded Side Table, Showing Pedestal Legs.

# CHAPTER XV

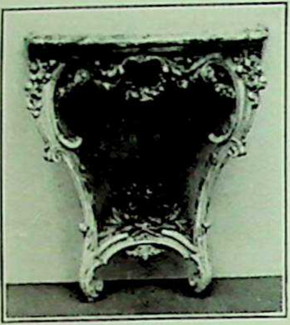
## LOUIS XV

### (THE ROCOCO PERIOD, 1723-1774)

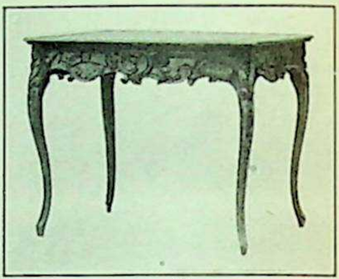
IN 1715 the death of Louis XIV left the succession to a child of five, who eight years later assumed the title of Louis XV. Affairs of state in the interim were directed by his dissolute uncle, the Duke of Orleans, from which we have what is known as the Regency period (1715-1723), notorious for its unbridled extravagance and wanton living. With respect to furniture it marked a completion of the transition already begun from massive pompousness to luxurious curves.

Unlike his great-grandfather, Louis at no time showed any military bent, but devoted himself unremittingly to the pursuit of pleasure. Dominated by Madame de Pompadour, Madame Du Barry and a host of sycophantic courtiers, he passed from one new diversion to another, shrugging his shoulders at hints of a nation impoverished to the breaking point and remarking: "After me, the deluge." At least he is so credited, the while England took from him first India, then Canada, because he could find no time or money to support his colonial governors.

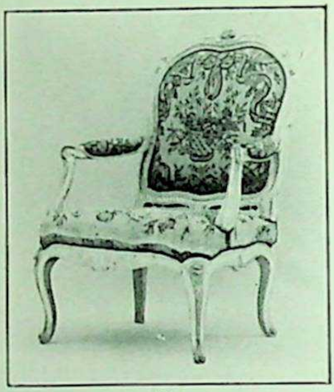
While he had no direct influence upon it, furniture during his reign lost the last vestiges of Renaissance character and became not only more profuse but attained the acme of comfort. The palace of the day was reconstructed to provide a variety of livable rooms in place of the dreary succession of vast ballrooms and the consequent impetus to ingenuity in furniture design brought out a host of small pieces such as writing desks, love seats, boudoir tables, card tables, writing tables and the like. Chairs no longer required two strong servants to move them and the luxurious bergere, deep sofa and chaise longue first came into being.



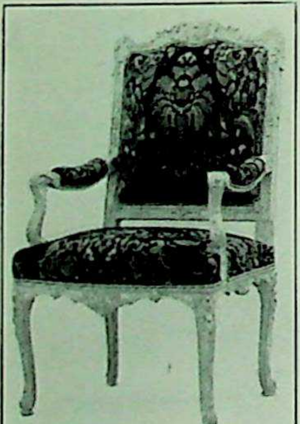
1



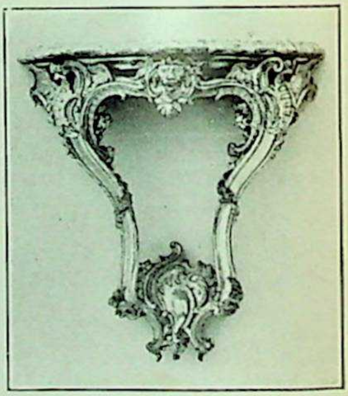
2



3



4



5

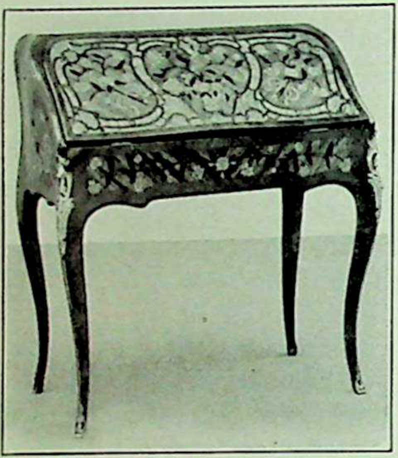
Plate XXX.—1. Louis XV Marble-top Rococo Console with Scroll Foot. 2. Louis XV Carved Occasional Table. 3. Louis XV Painted Armchair, Upholstered. 4. Regency Transition Armchair, Showing Square Louis XIV Back, and Louis XV Legs and Arms. 5. Louis XV Gilded Console, Illustrating Rococo Style of Carving.

In style Louis XV furniture represents the triumph of curves, a characteristic which makes possible recognition at first glance. With ease and luxury as their guiding principle, artists of the day created such a symmetry of line, wealth of decoration and fullness of comfort that from its first appearance may be dated a French dictation in furniture fashions that persisted long after it had ceased to be worthy. Chairs were broad in dimensions, carefully shaped to fit the body and richly upholstered in tapestries and embroideries depicting Watteau shepherds and shepherdesses, trellised arbors and pastoral love scenes in place of the historical subjects of Louis XIV.

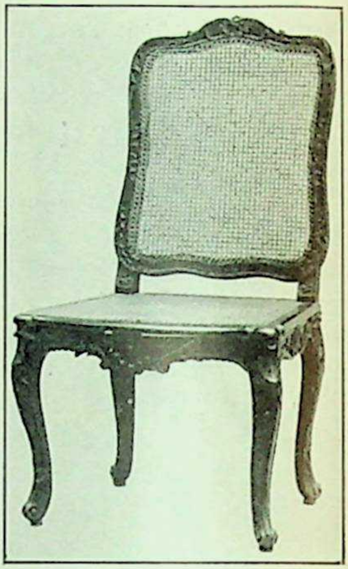
The frame was a continuous blend of curves to harmonize with which elaborate cabriole legs, serpentine tops and *bombé* (barrel shaped) fronts appeared on tables, consoles, commodes and cabinets. Later these pieces were enriched with *ormolu* (bronze) mounts on corners, and carving in addition to the familiar acanthus leaf, fruits, flowers, ribbons, wreaths, cupids and satyrs, is replete with *rococo.* This lavish style is a mingling of conventionalized rocks and sea shells and has survived down to our time as a term synonymous with the maximum in effulgent ornateness.

Before the end of his reign Louis dispatched a special mission to China and Japan, which on its return, brought curiously decorated gifts, the beauty of which captivated the jaded court's imagination. In meeting the vogue which quickly followed, the three brothers Martin were the leading imitators, their adaptations of capricious apes and monkeys being known as *singeries,* of dragons, pagodas and mandarins as *chinoiseries.* In all of this little or no attempt was made to preserve the orthodox oriental spirit.

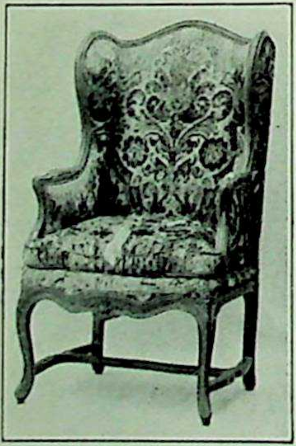
As one result color in general came into favor and several varieties of soft woods were used as a basis for painting as well as gilding. Vernis Martin, a lacquer system developed by the Martins in imitation of the Chinese method, became the rage and was applied as a distinctive finish to tables and cabinets in black, green, red, gold and speckled bronze, decorated in various relief designs and brought to a high polish. For other purposes rose-



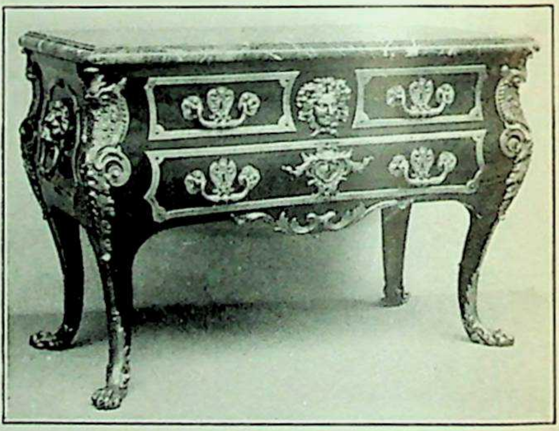
1



2



3



4

Plate XXXI.—1. Louis XV Marquetry Boudoir Desk, Showing Ormolu Knee Mounts. 2. Louis XV Cane-back Side Chair. 3. Louis XV Wing "Bergère." 4. Louis XV Marble-top Table, Showing "Bombe" Front and Elaborate Ormolu Mounts.

wood and mahogany attained ascendency over walnut, being used extensively in stripe figured veneers with ebony and holly as inlay.

Owing to the expense in both materials and workmanship required to reproduce it at all faithfully, any popular demand for modern furniture of the Louise Quinze period is naturally limited. Handsome examples of domestic manufacture can be seen in the leading furniture stores of every important city, but a very large part continues to come from France where the local industry exports to all countries. As a style it is essentially fitted for the more pretentious type of home, chiefly in the form of arm chairs, bergeres, foot stools and small tables for the living room and consoles for the hall.

The French walnut and mahogany systems indicated for Louis XIV are appropriate finishing methods. Except for hotels and clubs little gilded work is done; there is even less of Vernis Martin.

# CHAPTER XVI

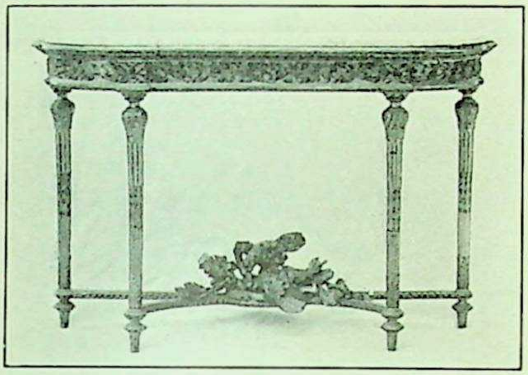
## LOUIS XVI

### (THE CLASSIC REVIVAL, 1774-1793)

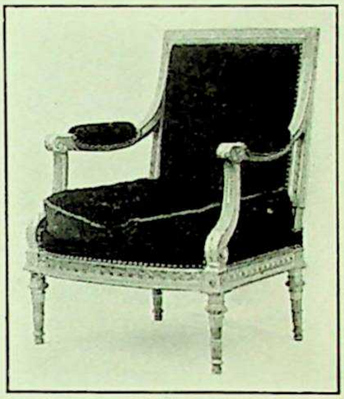
SOME fourteen years before the coronation of Louis XIV, new light was thrown on the life and customs of the ancient Romans through the excavation of Pompeii and Herculaneum. In the years which followed, a nobility, wearied of dissipation, sought fresh novelty in discussions of Roman democratic government, fired by which a number of younger scions crossed the Atlantic to help its revival as conducted by George Washington.

Unlike his two predecessors, Louis himself was a man of simple tastes and limited intelligence. Far removed from contact with his humbler subjects he preferred to tinker with locks than manage affairs of state while the beautiful but frivolous Marie Antoinette created a play world in which she and her boon companions were rustic shepherds and shepherdesses. The combination of indifferent monarchs and an aristocracy intoxicated with classical democracy proved too much, and in 1792 a long suffering people rose to make bloody reality out of polished theories.

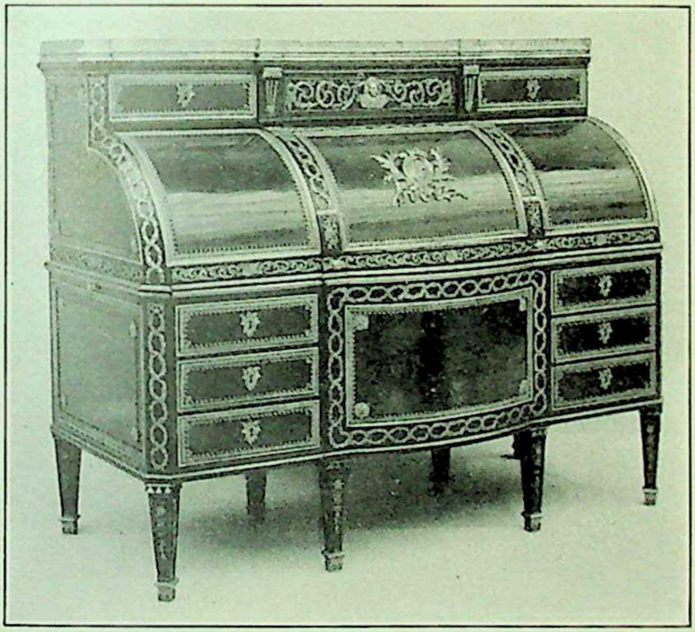
Responsive to the trend, furniture in the meantime appeared in lighter, straighter forms replete with classic daintiness. The elaborately simple furnishings of the Petit Trianon, executed for Marie Antoinette by Riesener, give us some of the best examples of the period. A profusion of tables is particularly noticeable, flower tables, writing tables, card tables, work tables and even extension tables. Bedsteads with fronts and backs of the same height made their appearance and the bombe fronted commode of Louis XV gave way to the rectangular form with which we are familiar today.



1



2



3

Plate XXXII.—1. Louis XVI Marble-top Side Table. 2. Louis XVI Upholstered Armchair. 3. Louis XVI Cylinder Desk, Showing Ormolu Decoration.

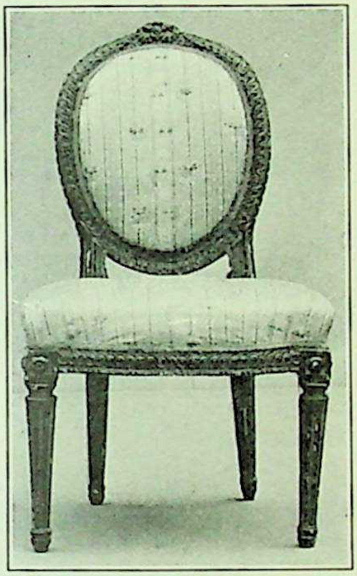
The straight leg, round, tapering and often fluted, replaced the elaborate cabriole of Louis XV, just as classic ornamentation, the Greek band, the natural acanthus, the laurel wreath, rosettes, flower baskets and medallions appeared instead of scroll work, rococo and amatory subjects. In its rectangular contours and restrained decoration, Louis XVI furniture represented a natural reaction from a florid, exaggerated taste to an elegantly simple one.

Curves appear only in oval chair backs and on flared arms resulting in a soundness of construction superior to that of the preceding period. Upholstery of brocade and embroidered satin divided honors with Aubusson and Beauvais tapestries while comfort was increased by padding chair and sofa arms. Ormolu (brass or gilded bronze) mounts appeared in classic designs on tables and consoles, combined with striped veneers to produce rich contrasts.

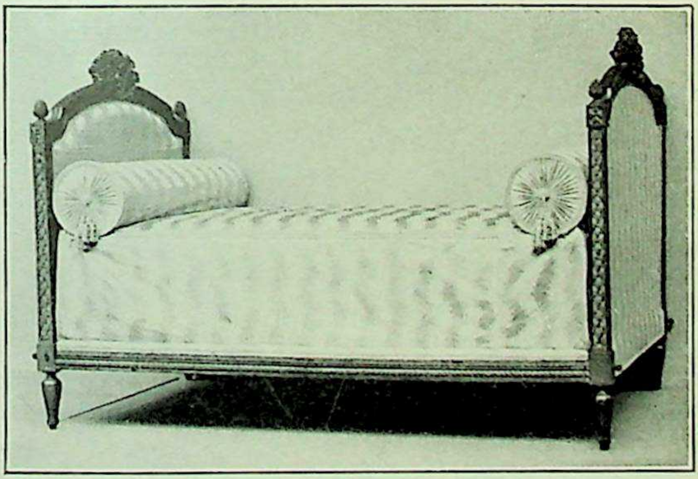
Walnut, satinwood and mahogany represent the popular woods, but in line with the increasing note of gaiety, there was much painting of soft woods to match or harmonize with backgrounds of pale blue, pale gray, rose, light green, etc. For it must be remembered that in all of these French and contemporaneous periods furniture was simply an adjunct of a unified room scheme comprising drapes, painted or carved panelled walls and specially woven and colored floor coverings.

Modern reproductions of Louis XVI are most widely offered in adaptations for the bedroom and dining room; odd pieces for the living room like tables, desks, armchairs and footstools are copies largely of foreign manufacture. Owing to its simple construction and restrained ornamentation, the style lends itself particularly well to painted and upholstered designs. In spirit it harmonizes admirably with Adam and Sheraton pieces and does not require an elaborate background.

For a style of such wide modern popularity there is necesarily a wide choice of finish including practically all shades of walnut from French walnut to antique. The lighter tone should also be preserved in the case of mahogany which should not be stained darker than Adam. Carvings on walnut may be high-lighted if desired with gold bronze; painted furniture in the shades previously mentioned may be antique glazed and ornaments two-toned in harmonizing colors.



1



2

Plate XXXIII.—1. Louis XVI Oval Back Upholstered Side Chair.
2. Louis XVI Bedstead.

# CHAPTER XVII

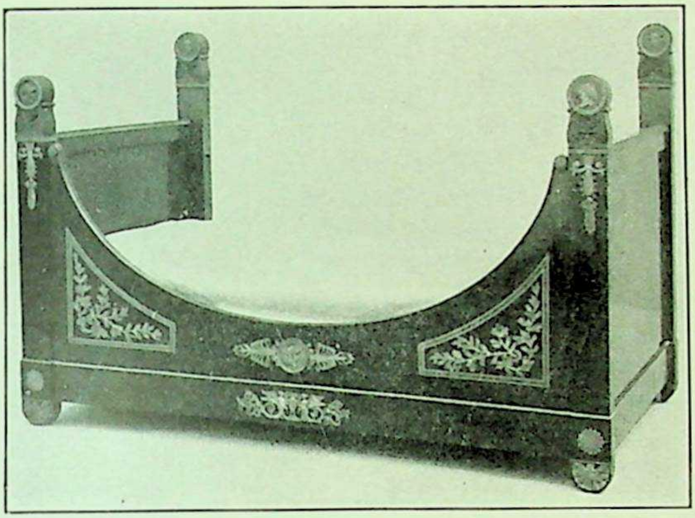
## FRENCH EMPIRE

### (THE DIRECTOIRE AND NAPOLEONIC PERIODS, 1799-1814)

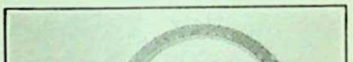
IN CONSIDERING this era we have one of the foremost examples of how history writes itself into the furniture. The classic revival of Louis XVI was largely a philosophical one; with the stabilizing of the French Revolution in 1795, a practical revival was attempted with France as the heir of the ancient Greek and Roman republics, governed by a senate and a directorate of three called consuls. From this regime, superseded by Napoleon's coronation as emperor, we have the brief "Directoire" period, serving largely as an introduction to Empire, but developing during its short life certain outstanding characteristics.

Like Louis XVI, Directoire follows the lines of Greek grace and delicacy rather than the Roman grandeur, brutality even, of Napoleon. But the treatment was republican rather than monarchical, evincing itself in a severer, more rectangular note featuring its ornamentation in a manner which would have been regarded as harsh in Louis XVI. Thus all of the classical emblems were retained, but more with an idea of copying than adapting. Nevertheless it achieved a certain livableness which cannot be attributed to the more aristocratic style it succeeded.

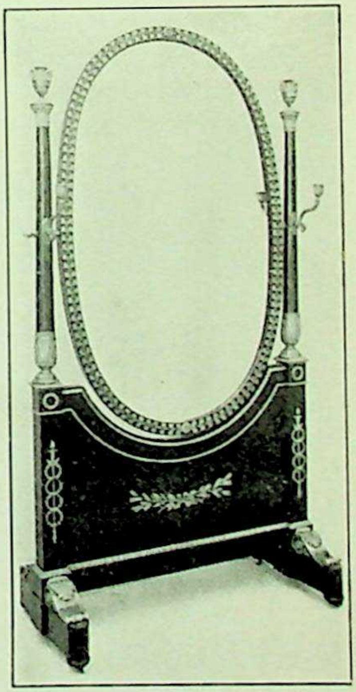
His fellow consuls once overthrown and himself proclaimed emperor, Napoleon actively furthered the erasement from French memory of all recollection of the old regime. To fulfill his purpose in the field of interior decoration, Napoleon set up a committee of artists headed by David, all not only capable but strongly imbued with both the classic tradition and faith in the Napoleonic star of destiny. Overnight, so to speak, they created



1



2



3

Plate XXXIV.—1. Empire Bedstead, Showing Classical Brass Mounts. 2. Empire Dressing Table. 3. Empire Cheval Glass.

the Empire Style, born of political necessity and nourished by popular intoxication.

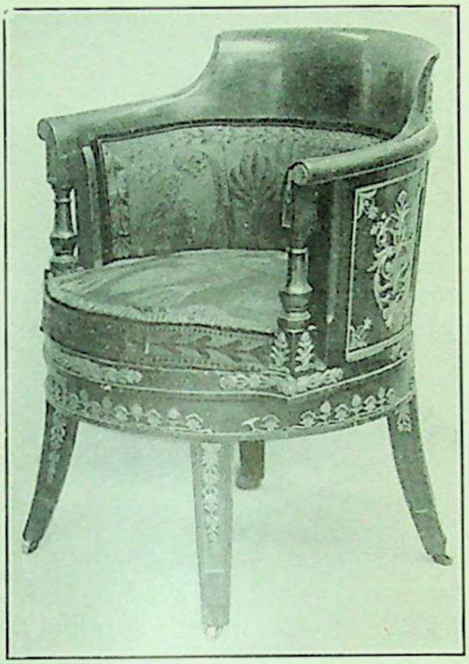
Despite its *fiat* origin and militaristic pomp, French Empire developed a massive dignity that gave it popularity on two continents. It was adopted in America because of an accord dating from French aid to the revolting colonies. England took it and adapted it because of a traditional dependence on things French in matters of style and despite a bitter hatred of anything pertaining to Napoleon. Even Sheraton was forced to adopt it, and in America our own Duncan Phyffe gave it a new beauty.

Significant French furniture of Empire design includes tables with end scroll and centrally grouped pedestal legs supported either by a heavy recessed base or a similar frame mounted at the four corners with claw feet. Beds and sofas, too, were massive with gondola or sleigh fronts and backs, straight or scrolled over in the manner of a Greek couch. Chairs were of the Roman curule type, with straight carved or fluted front legs and plain rear legs curving backward. Seats were liberally upholstered, and when without arms, were given square seats and backs, otherwise deep with sides and back rounded into one piece.

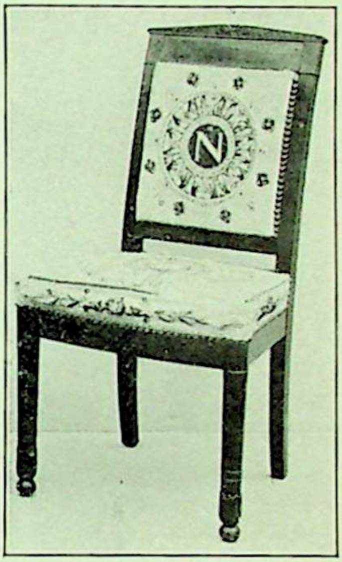
The *bureau* is an Empire creation growing out of a desk and is still not only a term for furniture, but signifies in France an office as well. The addition of a mirror and a rearrangement of the interior accomplished the transformation. At this time, too, passed out the canopied four poster which had flourished as a bedstead model since the earliest Renaissance. Tilting pier or cheval glasses also came into use mounted on typical sturdy framework.

But it is in decoration as well as form that Empire is truly distinctive, representing a studied return to the symbolism of Egypt, Greece and Rome. The lotus, the sphinx, the swan's neck, the Athenian bees, the acanthus, the honeysuckle, the torch, the bundle of fasces, the eagle, the lion, winged victory and caryatides all mingled with war-like trophies and the laurel wreath encircling the letter "N" to express the personality of Napoleon and his imperial power.

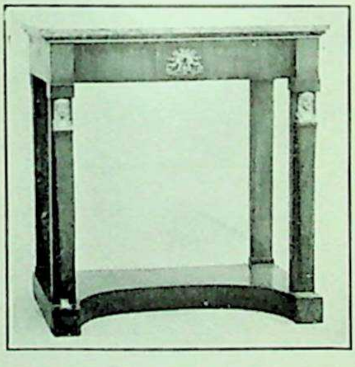
In woods, mahogany, both solid and veneer, received prefer-



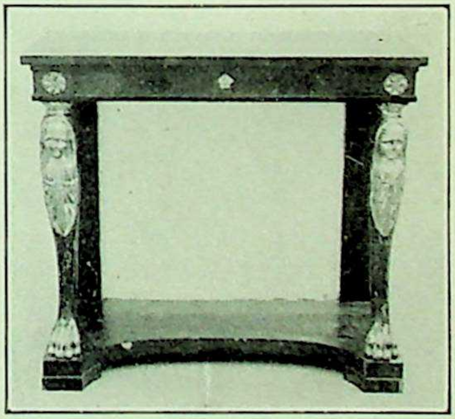
1



2



3



4

Plate XXXV.—1. Empire Armchair, Adapted from the Ancient Roman Sedia. 2. Empire Side Chair, Showing Characteristic Use of Letter N on Upholstery. 3. Empire Marble-top Side Table. 4. Empire Console Table, Showing Early Use of Claw Foot.

ence over all others, ebony and rosewood being reserved only for a few special pieces. It is in the contrast between this deeply colored mahogany and gleaming brass mounts that Empire becomes handsome and impressive. Considerable painting and gilding of cheaper woods flourished in combination with caning; upholstery was executed with brocades, silks and velvets in strong colors. Marble tops were common on tables and marble was also employed for pedestals. Glass was favored for knobs on cabinet work.

For decades Empire was the most popular of our furniture styles, but excepting in the early days, not as French but as American Empire. Brought over to this country early in the nineteenth century, it took hold at once, and as befits a democratic society, was greatly modified as to decoration and somewhat as to style. Today the vogue for any kind of Empire has passed, and where once it was seen in almost every room of the house, it is now produced in a very limited way and rather as adapted by Duncan Phyffe.

There are various finishes for French Empire, that for mahogany being traditional. The stain is composed of two parts red and four parts brown aniline dry stain to the gallon of water, sanded, shellaced, varnished, rubbed dull, then polished to a high lustre. The walnut finish is entirely modern; it calls for an antique color and a dull eggshell lustre. Corner ornaments are usually of wood, gold bronzed to simulate the Empire brass mounts. Floral decorations are applied to drawer fronts and panels which may also be inlaid with rosewood, tulipwood or curly maple.

Solid colors are particularly appropriate on Directoire or Empire caned chairs and settees, the cane being antique glazed and high-lighted to give a worn effect. On the frame, correct paint or enamel colors include deep browns, rich green, crimson, royal blue and purple, rubbed dull to produce the desired matte lustre. Decoration should be classical in theme, worked out in gold, silver or a light shade harmonizing with the enamel. Banding is often supplemented by striping in two tone effects, but antiquing is not required.

# CHAPTER XVIII

## AMERICAN COLONIAL

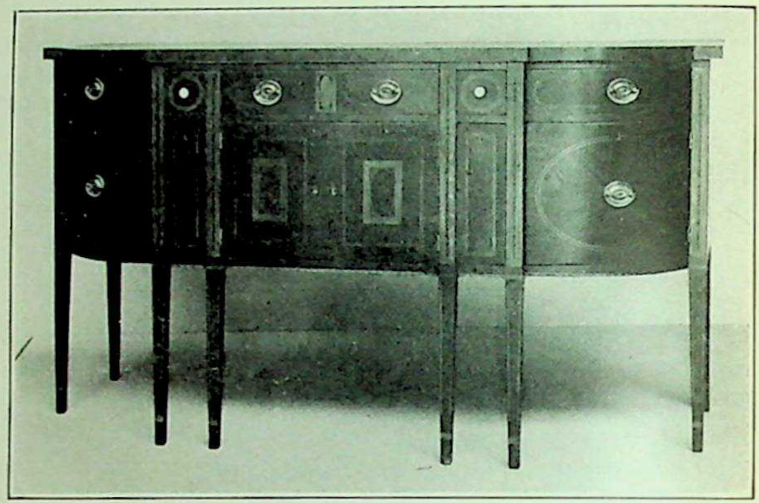
## (1620-1810)

THERE is a rather widespread impression that furniture produced in America prior to the Revolution represents a distinctive style, now denoted as Colonial. In point of fact, practically all of it bears the impress of some contemporary English period and for the sake of convenience, Colonial furniture is best treated from the three stages of this development: Early or New England (1620-1720); Middle (1720-1765); Late or Georgian (1765-1795).

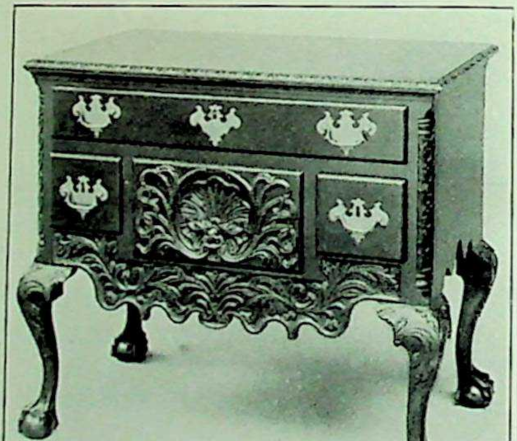
### EARLY

The first hundred years of our Colonial history was a period of hardship and hence of the greatest simplicity in point of home furnishings. The most precious objects were brought from England and served as models for the skilled artisans among the colonists who faithfully duplicated these Elizabethan and Jacobean pieces, modifying their ornateness wherever possible. For it must be remembered that the first Colonial homes hardly afforded a background for highly carved or decorated furniture. Many had but one large room; the planked floors were seamed with oakum, the walls covered with boards or crudely plastered, the ceilings supported by rough hewn beams. The fireplace was often eight feet wide and surrounded by cooking utensils.

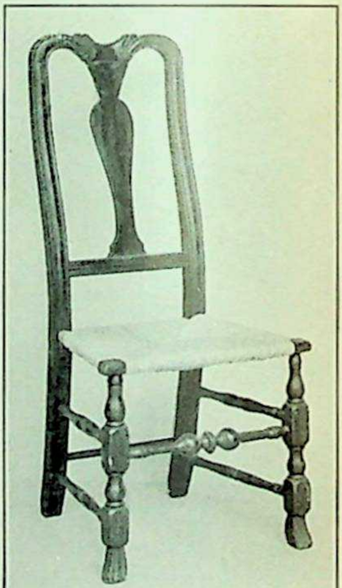
Characteristic furniture consisted of one or more chests, serving alike for seating and storage, a cupboard, a dresser, a settle, a trestle table and two or three chairs and stools. Every room, even the parlor, contained a canopied bed. Oak was favored for carved wainscot chairs, cupboards, chests and long tables, pine



1



2



3

Plate XXXVI.—1. Colonial Sheraton Mahogany Sideboard, Inlaid. 2. Colonial Mahogany Lowboy, Probably Made by Savery, Showing Queen Anne Influence. 3. Splat-back, Rush-bottomed Chair, Showing Spanish Foot (Maple).

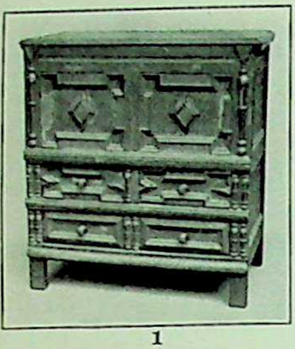
for rush-bottomed, ladder and spindle-back chairs and maple for smaller tables and bedsteads. Many of these pieces have distinctive names—butterfly tables, Providence tables, Salem hutches, Hadley chests, Carver chairs, etc.

### MIDDLE

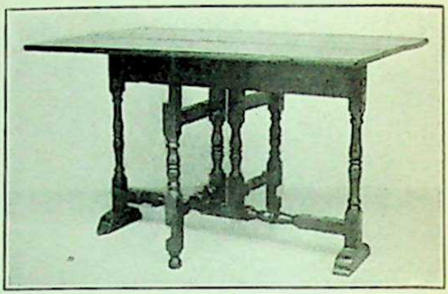
With the opening of the 18th century the vigour and determination of the colonists who had crossed perilous seas to find civil and religious freedom found new outlets in commerce. Active trade with the West Indies, Africa, Holland, England and France created a well-to-do class of merchants who built spacious homes and furnished them in keeping with their means. The living room was no longer identical with the kitchen, but filled the length or width of the house, and in place of rough plastered walls, appeared panelling in walnut or mahogany carved in the classic spirit and solidly constructed by ship carpenters. Elegant waxed flooring took the place of planks, and smooth plaster concealed the stout oaken beams, while cupboards displayed rare china and silver rather than kitchen utensils. In the same room we may see a towering oriental lacquered secretary mounted on William and Mary inverted cup legs, a gate-leg table of the Jacobean period, a Queen Anne cabriole leg chair with rush bottom and splat back, a squat bun-foot mahogany desk of the Plymouth or Governor Winthrop type, and perhaps a Dutch "kas" or cupboard painted in dull gray or green and decorated with fruits and flowers.

### LATE

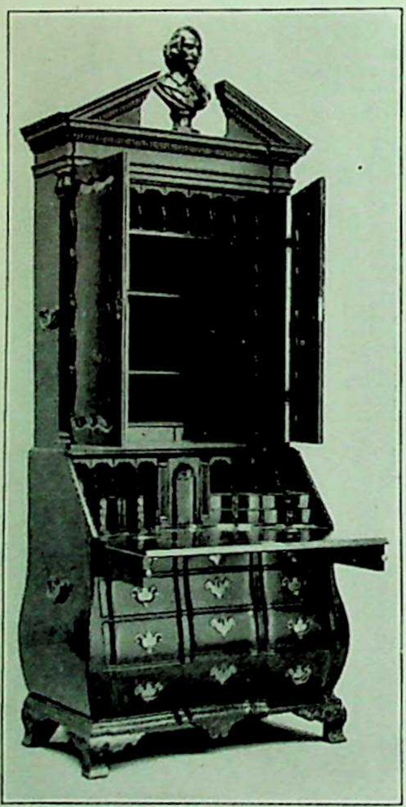
During the Revolution no good American if he could help it bought anything of English origin, but cabinet makers had no other sources of inspiration and loyalists continued to demand the designs of Chippendale, Hepplewhite and Sheraton. Thus Georgian styles found their way into the new republic and by their sheer beauty captivated the otherwise resentful "Colonials." The list includes tea tables, tilt top "pie crust" tables. oriental lacquered highboys and cabriole chairs.



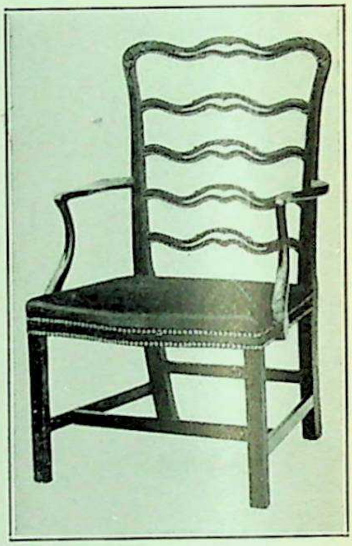
1



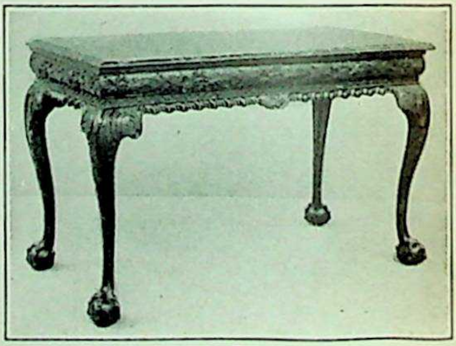
2



4



3



5

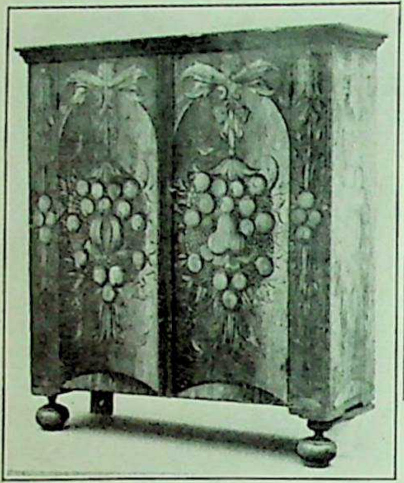
Plate XXXVII.—1. Early Colonial Carved Chest (Oak). 2. Colonial Gate-leg Table (Cherry). 3. Colonial Chippendale Ladder-back Chair (Mahogany). 4. Colonial "Bombe" Cabinet Desk, Showing Broken Pediment Top and Brass Fixtures (Walnut). 5. Colonial Mahogany Pier Table, French and Queen Anne Influence, Probably by Savery.

It is during this period that William Savery, a cabinet maker of Philadelphia, created some notable styles. Chippendale in spirit, much of the carving shows a decided Louis Quinze influence, the perfect execution of which is singularly rich and appealing. By the end of the century mahogany had won its way to the front, but earlier models were executed in black walnut, an especially fine variety of which grew along the banks of the Schuylkill river.

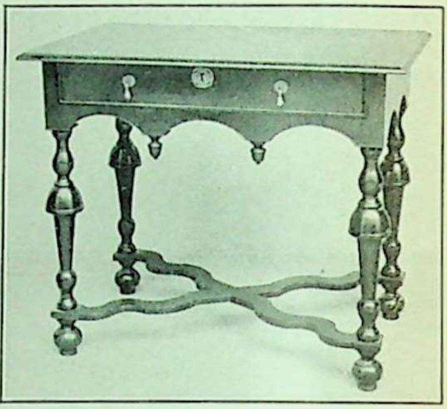
Curly maple was a popular substitute for satinwood and birch was employed for day beds and the various types of Windsor chairs; hoop-backed, fan-backed, comb-backed, etc. Painting, marquetry and inlay were not greatly favored, for ornamentation in the Colonies was of necessity and of choice far more restricted than in the mother country. From 1790 to 1810 the Sheraton influence superseded that of Chippendale.

Of the Colonial furniture of Virginia and the South during all three periods we know but little. At Mt. Vernon may be seen a Sheraton chair, a Louis XVI chair, a rush-bottom Jacobean chair and a Windsor chair. For the rest it would seem that no purely local furniture was developed, the wealthy plantation owners importing direct from London and Philadelphia cabinet makers and discarding old styles for new as fast as they appeared. It is interesting in this connection to note that Thomas Jefferson on his estate at Monticello built the first swivel chair and in Philadelphia Benjamin Franklin invented the first rocker.

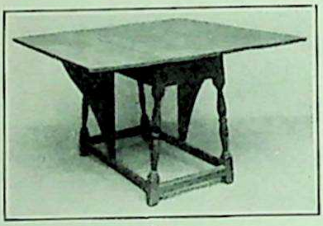
In respect of finish as in point of design American cabinet makers closely followed contemporary European methods. Modern Colonial mahogany reproductions are stained red or reddish brown and filled to match. Walnut is stained a shade between French and Antique known as American. Birch Windsor chairs are usually stained with brown mahogany oil stain, although originals were for the most part painted black or dark green. Oak is stained Jacobean brown, pine dark brown, gray or ebony black, maple a rich, golden amber. Except for carving decoration took the form of bands or stripes of dull green, red or blue, panels embellished with conventionalized floral groups, yellow or gold on a black or other dark background.



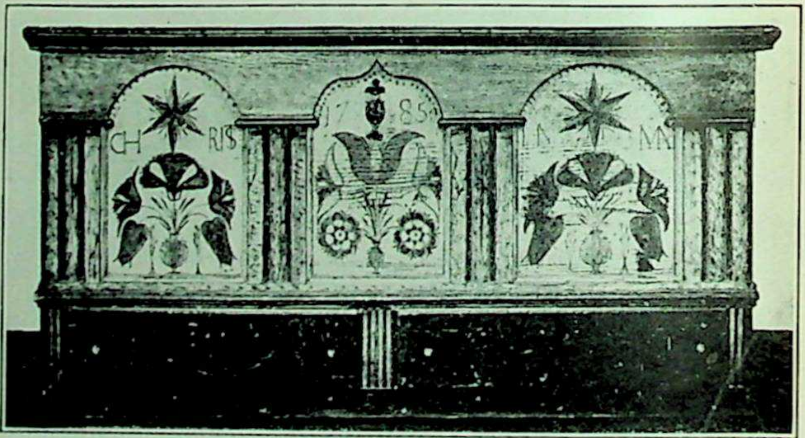
1



2



3



4

Plate XXXVIII.—1. Dutch Colonial Kas, or Cupboard, Painted, with Ball Feet. 2. Colonial Dressing Table, Showing Strong William and Mary Influence (Walnut). 3. Early Colonial Butterfly Table (Maple). 4. Pennsylvania German Chest, Showing Typical Painted Decoration.

# CHAPTER XIX

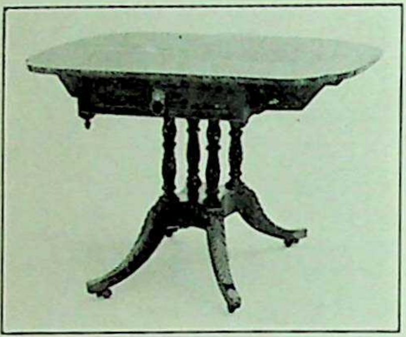
## DUNCAN PHYFFE AND AMERICAN EMPIRE

(THE POST COLONIAL PERIOD, 1795-1840)

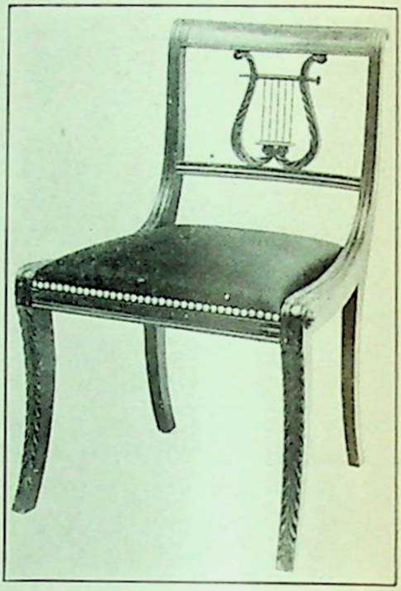
ASIDE from Savery of Philadelphia but one other American cabinet maker executed designs touched by anything like the genius of Chippendale and Sheraton in England. Migrating from Scotland as a boy in 1783, Duncan Phyffe learned his trade at Albany, and on moving to New York a few years later soon attracted attention. He became very prosperous, numbering among his patrons such leading citizens of the new Republic as Aaron Burr, Alexander Hamilton and John Jacob Astor. One of the last of the old time cabinet makers, he saw before his death in 1854, the dawn of the industrial period in furniture manufacture.

At first Phyffe drew for inspiration on Hepplewhite and Sheraton, but with the opening of the nineteenth century, an increasing vogue for things French caused him to combine with his English models elements of Directoire and Napoleonic Empire. Still later, as the latter attained its full flower, he adopted its massive proportions in entirety but much simplified as to ornamentation, and with all of his earlier faithfulness to sound construction and careful selection of woods. Before retiring Phyffe had practically become a manufacturer with his own yard for lumber seasoning and a shop employing as high as a hundred men.

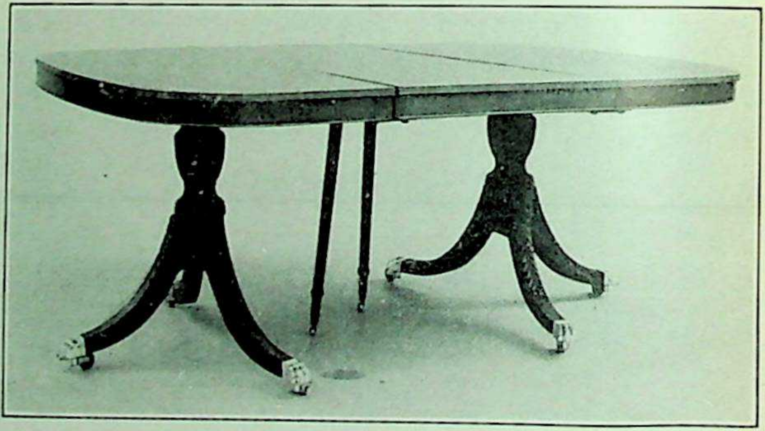
Duncan Phyffe original pieces are now regarded as heirlooms and the style is recognizable chiefly through chair backs showing lyre splats and diagonal cross bars, chair legs faced reversely in the Directoire manner, acanthus carving, lyre, collonade and pedestal table supports with three legs flaring outward. For



1



2



3

Plate XXXIX.—1. Duncan Phyffe Drop-leaf Colonnade Table. 2. Duncan Phyffe Lyre-back Side Chair. 3. Duncan Phyffe Long Table, Showing Flaring Legs and Brass-Mounted Feet.

ornamentation he relied on fancy veneers of mahogany combined in some cases with banding or inlay of satinwood or maple. Elsewhere appeared reeded or beaded moulding, fluting and brass drawer pulls and mounts for lion's-paw table feet.

Modern reproductions favor his earlier designs of delicate outline and are executed in mahogany stained a light brown color, something on the order of Adam, finished in clear lacquer to reveal clearly the wood grain. Originals were French polished and show the mellow sherry wine tone of aged natural mahogany. As a style it is excellently suited to the average American interior where it is attaining a deserved popularity for the bedroom and dining room. It unites dignity and delicacy in a singularly happy degree, blending with simple or pretentious surroundings and harmonizing with all of the Georgian styles.

### AMERICAN EMPIRE

The brilliance of the first Empire's military successes combined with a post-Revolutionary resentment of all things British to render French taste in furniture exceedingly popular in the young American republic. The flamboyancy of French Empire, however, was severely modified, with little of the elaborate carving and few of the profuse brass mounts, warlike emblems and marble pillars so essentially a part of the Napoleonic originals.

Often, and with no valid reason called "Colonial," American Empire was characterized by clumsy lines, claw feet and ponderous scrolls. The sofa was a significant piece with curving ends, flaring legs ending in carved lion's paw or eagle's claw feet, a straight top rail turned back with carved eagle head ends. Bedsteads were of the gondola, sleigh or four post type, the latter showing the familiar pineapple finials. Tables were provided with drop or insertable leaves and square ends, supported at the centre by a plinth or pedestal with flaring legs spread out to massive lion feet. Sideboards show scroll or pillar supports with a door at each end of the front and two in the middle. Later a popular fad called for a looking glass set in in the back rail.

Almost all American Empire was executed in mahogany, the matched veneers being laid over a pine base, although some pieces were turned out in curly maple and even rosewood. Carving was fairly profuse in the beginning as was inlay of brass, but except for fluting, little survived in the way of ornamentation with the invention of woodworking machinery. Drawer pulls consisted either of glass knobs or of a ring set in a lion's mouth. Caned settees were painted black and striped with gold.

As an original style American Empire varied greatly in merit according to the method of treatment and, compared to much that was produced in the latter "gimcrack" era, constituted a thing of dignified beauty. It retained its popularity well through the nineteenth century, but today is looked upon as a curiosity; in its earlier manifestations only has it any interest in the eyes of collector or designer.

At first the mahogany was polished on the bare wood with shellac and linseed oil to a brilliant lustre. In time a vogue grew up for coloring the veneer a deeper, richer red with a dye distilled from the liquor of boiled West Indian logwood chips. It was then shellaced, varnished and polished with so many coats that the true beauty of the veneer was well-nigh obliterated. The modern practice calls for a deep red tone known as Colonial and a pale varnish polished to a high lustre.

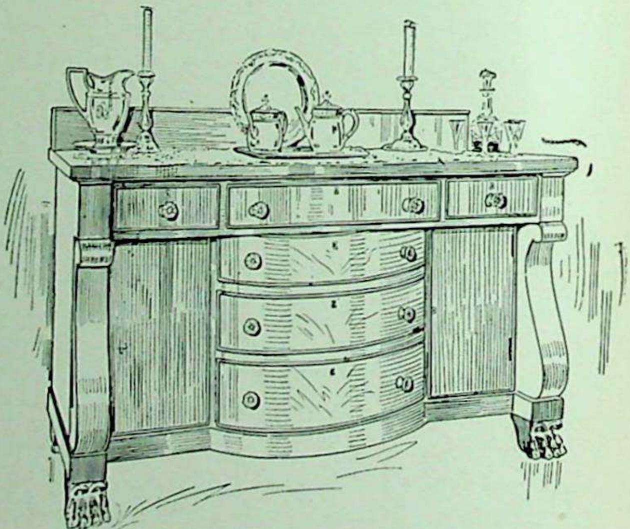


Plate XL.—American Empire Sideboard, Showing Massive Contour and Scroll Supports.

# CHAPTER XX

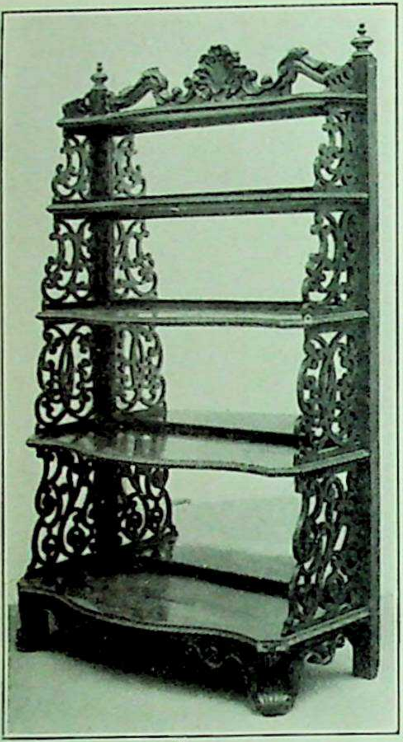
## VICTORIAN AND MISSION

## (1840-1900)

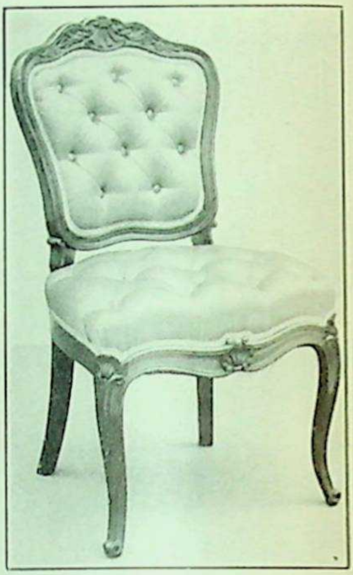
TOWARD the middle of the nineteenth century a change came over the spirit of furniture design, partly perhaps as a reaction from the swift brilliance of the Georgian era, but more probably due to the increased perfection of woodworking machinery. Hitherto furniture had been made exclusively in shops, all the work being done by hand, so that only the wealthy could be looked to for patronage. Thus a table by Duncan Phyffe cost $265 and a pair of card tables $135, which in view of the value of money in those days, would make the prices today equivalent roughly to three times these amounts.

When it was discovered that machinery could turn out furniture in quantities limited only by the demand, there was a rush, in America as in England, to get into the business. Dazzled by the new opportunity for wealth, artistic merit was ignored in a disorderly race to see who could excel in novelty. The result was an avalanche of gimcrack, gingerbread designs that today would be rejected even by the least educated and that caused machine-made furniture to become a term of reproach. Small wonder then that the cabinet maker continued to flourish—for three or four decades the wealthier classes and the United States government itself consistently preferred the higher priced hand-made output rather than accept the factory-made product.

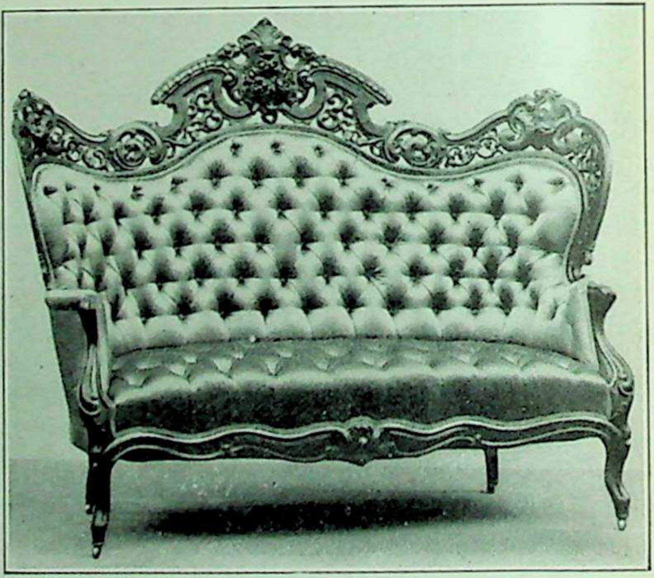
The worst of this period of decadence, such as Eastlake and New Art, has been hidden or forgotten, the best is known as Victorian. At its first dawning even Sheraton, like Duncan Phyffe in America, had been affected and his Nelson chairs and pseudo Empire sideboards were plain freakish. Thomas Hope, an architect, attempted to revive pure classic and achieved only



1



2



3

Plate XLI.—1. Victorian Whatnot, for Exhibiting Knickknacks. 2. Victorian Side Chair, Upholstered in Satin. 3. Victorian Sofa, Upholstered in Satin.

the cold rigidity of a museum display room; Augustus Pugin sought a vain revival of Gothic, but the desire for novelty had become too great—the architect no longer controlled; he could merely protest or suggest.

The only successful exponent of a new style was Eastlake, an English architect who published a book of designs in 1868. The style was produced extensively in mahogany and walnut, with tufted red plush upholstery and a profusion of fringes, tassels, knobs, spindles, corkscrews, spools and scalloped edges as the chief characteristics. No attention was paid to beautiful veneers, decoration or fabrics—the eye was entirely taken up with fussy outline and meaningless detail.

We are perhaps too close to the so-called Victorian style to judge it impartially. The modern verdict condemns it as thoroughly bad, with its glistening black hair-cloth sofas, plush brocade chairs, what-nots and general air of fixed smugness. Yet a visit to Roosevelt House, the restored birthplace of Theodore Roosevelt in New York City, reveals it in a new light of substantial elegance and spacious comfort, the mahogany and rosewood stained a deep blackish tone, the walnut a light reddish brown, either varnished or waxed. It is its bulky awkwardness and general immobility that make it unsuitable for our age of small homes and simplified housekeeping.

At the London Exhibit of 1851, brass and iron beds were first shown and at the Paris Exposition in 1889, the first effort was made to introduce a new French style, by name "L'Art Nouveau." Presuming to draw its inspiration from nature the lines were curving, attempting in the flowing pattern of the carving to reproduce the effect of twisted branches, vines, roots and leaves. It was worked out in gilt, mahogany and pastel shades of enamel and died the early death of all extremes.

About the close of the nineteenth century a style developed known as Mission which ran to the simplest of straight lines. It was the outgrowth of furniture found in the California missions which was in turn a development of Spanish styles prevailing in the eighteenth century as reconstructed by the missionary friars of southern California with what tools they could find at hand.

In commercializing it unfortunately the worst rather than the best was adopted as already indicated in the chapter on Spanish Renaissance.

Oak was the wood uniformly employed, stained various shades of brown, gray and green according to the fancy of the manufacturer, the pores left unfilled, then shellacced and waxed. Fumed, a light brown color, was the most popular shade. The later golden oak, a new finish of glossy lustre, did not represent any distinctive style.

By the opening of the twentieth century the furniture manufacturing industry in the United States had passed from the hands of mere profit seekers to men with an increasing perception of the value of correct design. From this time the industry has progressed steadily to a realization of its position as heir to all the periods, free to adapt or to adopt and fully conscious of its tremendous influence in developing good taste rather than mere catering to the vogue of the moment.

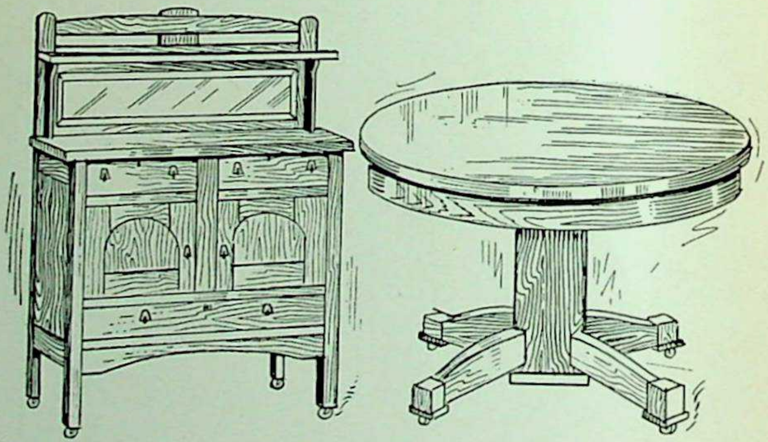


Plate XLII.—Mission Sideboard and Table of Oak.

# BOOK II

# Furniture Finishing

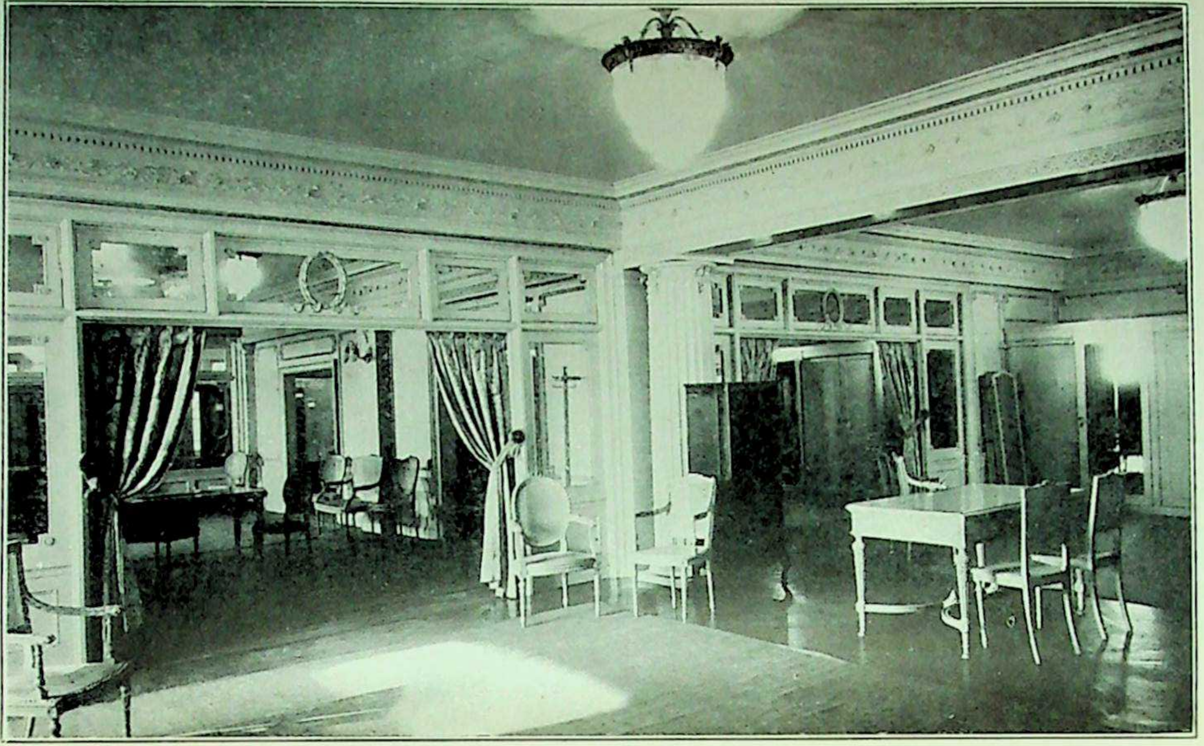


Plate I.—The Walls, Floors, Ceilings and Furniture of These Rooms Were Finished with Lacquer.

# BOOK II.

## CHAPTER I

### BRIEF HISTORY OF FURNITURE FINISHING

ANY account of furniture finishing and finishing materials must necessarily be brief, owing to the limited supply of information on the subject. In the book of Jeremiah we find, "Woe unto him who sayeth: I will build me a wide house, sealed with cedar and lined with vermillion." This is the first historical mention of a paint material. Painted furniture in the tomb of King Tutankhamen gave evidence of the art of painting over three thousand years ago. We have evidence of paint being used four thousand years before Christ.

Sculpture was first highly developed by the Greeks, and painting was not fully developed until the Italian Renaissance of the fifteenth century. Paint pigments (mineral and earth colors), organic dyes, and white lead were first mentioned by Theophrastus about 350 B. C. White lead was known as "cerrussa" and found in Europe in small quantities as carbonate of lead. This material was mentioned also by Pliny, about 50 A. D.

The original Dutch process of making white lead is about 300 years old and attributed to Stratingh. The process was patented in England in 1622. Leclaire discovered the use of zinc white used in paint, in 1845. Lampblack was used two thousand years ago by the Chinese and was obtained by burning oil in lamps with little air and collecting soot on the chimneys. Lampblack found on Egyptian mummy cases was found on the shores of the Black Sea.

Dr. Wm. Henry Perkin of England discovered aniline in 1856 and it was later developed by chemists in Germany and America. The earliest blue indigo was used in Egypt and India and mentioned by the early Byzantine writers. Natural ultramarine blue was used centuries ago, but the artificial product was developed by Christian Gmelin in France, 1828. Prussian blue was discovered by Diesbach in Berlin in 1710.

Ochre, the earliest yellow pigment, was used by the Egyptians, but chrome yellow was made but a hundred years ago. Malachite and verdigris were the first green pigments used and have been found on the wall paintings of Pompeii. Chrome green, so common today, was first made in France in 1838.

Waxes were first used as vehicles for colored paints which were later mixed with animal fats and oils to lower the melting point of the wax. For interiors, fish glue, vegetable gum and white of egg were the earliest mediums used for mixing with colors.

*Use of oil.*—The first mention of a drying oil as a paint vehicle was by Actius, a Greek physician of the sixth century, and this may have been linseed oil. In the library of Lucca is a manuscript giving information on how to make a transparent varnish from amber gum and linseed oil. One who understands the make-up of varnishes of today can see that the fundamental operations in making varnish have not changed materially, although new and more refined equipment, methods and raw materials have been developed.

Oil painting was developed in the eleventh century, but was a very crude art, for it was not until the sixteenth century that oil painting was fully developed. The development of the paint industry was slow until the revival of industry after the Civil War, which brought on many improvements in every line of industry.

*Turpentine.*—About three hundred years ago turpentine was discovered in the Southern American colonies by early settlers. Kauri gum was brought into England in 1769, following Captain Cook's discovery of New Zealand, and this is a very important gum in the manufacture of high-grade varnishes. China wood oil, or tung oil, used by the Chinese centuries ago in all kinds of lacquering, was introduced into spar or waterproof varnishes about thirty years ago.

A gradual development in the paint and varnish industry, rather than a radical change, is the result after nine centuries of improvement. One could easily say that the furniture industry has been far behind other industries, especially the finishing of furniture. It is not so long ago that material was put on furniture with a trowel while hot, before the use of brushes, and the varnish maker of colonial days peddled his varnish about the streets.

Formerly all material was applied by hand, with what is known as a sponge or rubber, over the entire surface of the furniture. This method necessarily took several weeks to finish a large piece of furniture, and as a result, only kings and nobles were in a position to have fine furniture, and even then, had to wait weeks for completion of a single piece.

After the advent of brushes the application of varnish and paint became much easier and faster. Paint and varnish materials in the last few years have been applied mostly by the air-gun or spray. This method of application of materials is the best method of applying thin liquids, because no brush marks or laps can be seen after coating. Stain, shellac, enamels, varnishes and lacquers may all be applied by this method.

## LACQUER MATERIALS

The advent of nitro-cellulose lacquers into furniture finishing is a very recent experiment. It has passed the experimental stage, as far as being accepted, for many of the manufacturers of cabinet furniture today are using some form of nitro-cellulose lacquer for a finish coating over water stain. This material was not at first adopted universally by furniture manufacturers because it was so radically different from varnish in drying, application and other properties, but time has ironed out these preliminary difficulties and proved its suitability for furniture use. With the use of clear lacquer it is advisable to choose carefully the type of stain and filler to avoid troubles. Water stain has proved most satisfactory and paste wood fillers, made purposely for use under lacquer, are now available.

Lacquer enamel, made from a combination of nitro-cellulose and pigments, mixed or ground together, forms a large part of the opaque materials used, instead of enamel formerly used for painting furniture. A good covering lacquer can be made by adding colors ground in japan with a suitable clear nitrocellulose lacquer, although it is advisable to use ready-made lacquer enamels whenever they are available.

There are many grades of lacquers on the market, and be it said, to the discredit of some manufacturers, that some of this material is little better than cheap varnish. Most of the lacquers are now bodied to a large extent with varnish gum (any gum soluble in toluol or alcohol will do). Of course an excess of gums will cause a soft film that will mark or a brittle film that will easily scratch, or perhaps turn white.

## DECORATIVE MATERIALS

To furnish bright furniture for drab surroundings or to satisfy a taste for the unusual, many different decorative finishes have been developed. Gilded furniture is quite an old thing with the Italians and French, but has never been popular in America. Before the advent of aniline stains, painted furniture, decorated in gold, was the vogue, but since permanent dyes were first used for stain, decorative furniture has been secondary in importance. In Book III will be found a description of all the modern decorative finishes and how to create them. By using different colors in polychrome finishing, many effects can be created. Glazing over different enamel ground coats and painting of floral and other designs is another type of decorative finish. Decalcomania transfers are now used in cheaper decorative furniture, rather than the high priced hand-painting, and many beautiful effects can be created at a low cost.

After all, plain wood finishing has followed the lines of least resistance and all woods are stained usually to imitate oak, walnut and mahogany. Few woods can imitate oak, but walnut and mahogany can be successfully imitated by skillful manipulation of stain. The above mentioned woods were the first to be made into furniture, especially the first two, and because of the naturally beautiful figure or grain of these woods, all others are made to look like them, with the possible exception of bird's-eye or curly maple.

In studying the advance in materials made for furniture finishing, one cannot help feeling that the real finishing material, or ideal one for the finish coat, is yet to be developed, one that will not scratch or mark or be affected by ordinary chemicals. This may be the next development, who knows?

LIBRARY
15237
JUN 30 1927
U. S. PATENT OFFICE

# CHAPTER II

## WOODS

### RED ALDER *(Alnus Rubra)*

RED ALDER is the leading hard wood of the Pacific Northwest and twenty-six million board feet are used annually by the furniture and chair industries of Oregon and Washington. There is little distinction between the sap and the heartwood until after it is cut. The wood turns to a reddish brown, or in the Fall, to a light golden yellow, and when thoroughly seasoned, it is a pale saffron color, and this makes it very desirable for imitating walnut or mahogany.

Red alder has a straight, fine, uniform grain. It has no definite figure, but sometimes the lumber shows streaks in the vertical direction, known as "pith-ray flex." If properly cared for, this wood does not warp, check or swell appreciably in place. Alder turns well and is suitable for staining, painting or any kind of finishing. This wood is similar to cottonwood, with the exception of its reddish brown color. It is moderately light and is soft in texture and also has good strength values in comparison with harder woods.

Another species of alder is known as "black alder." This is a native of Europe, Asia and Northern Africa. It is not used in America for the manufacture of furniture.

### BASSWOOD

Basswood grows over a large section of the northeastern part of the United States, from the Hudson River to the Mississippi, the largest forest being found in northern Wisconsin.

*Identification.*—Basswood is a very light wood, resembling yellow poplar, cottonwood and tupelo. The yellow poplar has a yellowish brown heart-wood. In cottonwood the medullary rays are very fine, in contrast with basswood which are visible to the unaided eye. The heart-wood is creamy brown with occasional dark streaks. The sap-wood is wide and not sharply defined and is very uniform in appearance. It is soft in texture, has straight grain and has very little shock resisting ability.

*Utilization.*—Basswood is used principally in the manufacture of veneer panels and makes a nice clean, smooth panel that can be used in the manufacture of drawers and cabinets, or on one side of plywood panels for cabinet furniture, the basswood being on the inside. Much of the waste of the timber is manufactured into excelsior, used for paper pulp, boxes, crates, etc. The principal uses are in the manufacture of buckets, wooden-ware, novelties, poultrymen's and dairymen's supplies, also in the manufacture of picture frames and mouldings, coat hangers for trunks, toys, fixtures, caskets, etc.

On account of the smooth finish, veneer made from basswood is stained or finished natural for drawers, but is never used on the outside of cabinets, unless it is to be painted or lacquered in solid colors, as there is no figure to the grain prominent enough to make a suitable finish.

## BIRCH

Birch is found principally in the southern part of the United States and north, following the eastern range of mountains, up to the eastern coast as far as New York, and as far north as the southern part of Minnesota and Wisconsin, and south, along the Mississippi to the Missouri and Arkansas valleys. Yellow birch is also found in the northeast section of the United States. The river birch or red birch, as it is commonly known, is the one mostly used in the manufacture of furniture, in both veneers and solid posts, frames, etc.

*Identification.*—This is an important wood in the construction of furniture, for when stained, it is very hard to distinguish from walnut, and in certain instances, is easily mistaken for

Plate II.—Curly Birch.

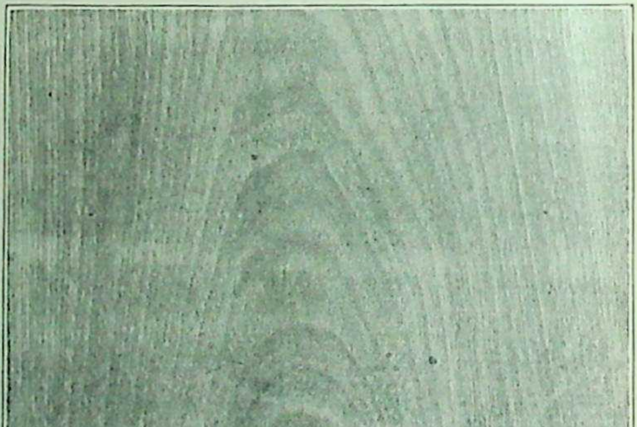


Plate III.—Birch, Straight-Sawed.

mahogany. This wood is very hard and has great shock resisting qualities. The rays are very fine and are not visible without a hand-lens. The annual rings are also indistinct. The sap-wood is wide and faintly reddish brown. The heart-wood is reddish brown and has no characteristic odor or taste. The pores are very small, but usually visible to the unaided eye. Red birch is distinguished from yellow birch by its abundant pith-flecks and lack of the wintergreen flavor in the bark. It may be confused with soft maple, unless one is particular to notice that the rays are more conspicuous in the maple.

*Utilization.*—Birch is used perhaps more than any other hard wood, with the exception of gum, for the solid construction of furniture. It is also used for manufacturing rotary cut veneer and plywood panels for furniture and architectural construction. This wood has a particular figured grain and the prominent markings are tinted with a faint red. An illustration is given to show the figure. Birch is sometimes finished with a light red stain, but in the majority of cases it is stained to match some other finish. Especially is this true in cabinet furniture, where the posts, legs and frames may be birch and the top, front and sides of walnut or mahogany veneer. This wood is very strong.

## CEDAR

Cedar is of several classes, known as western red cedar, swamp or white cedar and northern white cedar. The western cedar grows to a great height and is large and has red brown heart-wood. The eastern and southern cedar grows along the Atlantic Coast to Florida, and is known as swamp cedar, which is pale pink in color. The northern white cedar resembles the western red cedar which has narrow rings of plain brown color.

The annual rings of cedar are narrow but indistinct. Summer wood is thin and is not noticeable when cutting. One particular advantage of northern white cedar is that it does not contain rosin ducts, whereas other species of the cedar family do and are difficult to finish because of the rosin constantly seeping out.

*Identification.*—Red cedar has a characteristic odor and for that reason does not require any special description for identification. The pale color of the white cedar can easily be distinguished from the red cedar.

*Utilization.*—Both the white and red cedars are used in the manufacture of moth-proof storage chests, for the linings of drawers, cabinets, etc. This wood is usually finished natural without stain. See Book V for finishing methods.

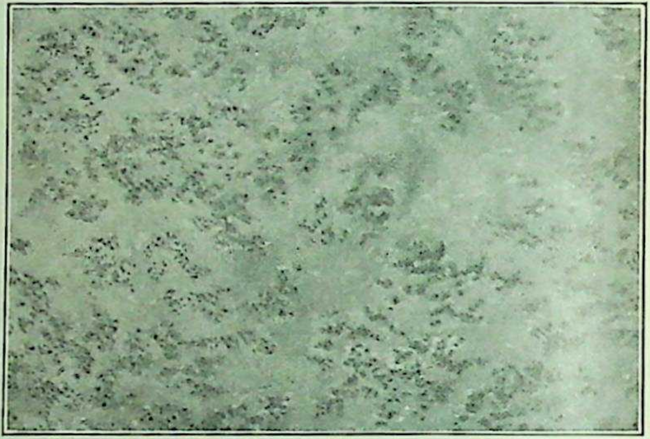


Plate IV.—Cherry Burl.

### CHERRY

Cherry is a commonly known fruit tree and the wood is similar to that of mahogany. It has a peculiar odor and is of reddish tinge, ranging from moderately dark to a very dark hue. Since it is very fragile and has little strength it has not been used of late in the manufacture of furniture. However, it is occasionally seen when refinishing antique furniture. It is finished natural in many cases, or can be stained very easily to imitate mahogany.

### CHESTNUT

Chestnut is found principally in the Eastern states from Pennsylvania to Georgia and Alabama, and mostly in the mountainous regions. It is not now used extensively in the manufacture of furniture. Chestnut may be confused with oak or black ash. Oak, however, is much heavier, but the chestnut has radial bands of pores which cannot be found in other woods, resembling it in figure of the grain. This wood is used in the manufacture of chairs to some extent and will be found occasionally finished in silver grey, as the pores are large and will take the white filler easily. It will also be found in the manufacture of certain types of breakfast-room furniture and can be stained any shade of brown and finished in any way, similar to oak.

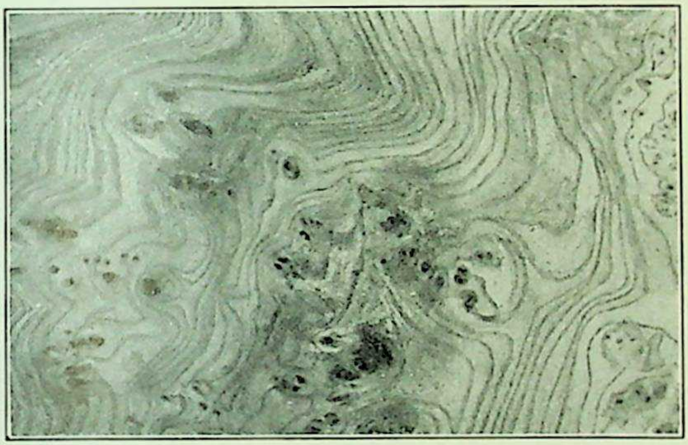


Plate V.—English Elm Burl.
(Used for Overlays on Decorative Furniture.)

### ELM (WHITE ELM, SLIPPERY ELM, CORK ELM)

White elm and slippery elm are found growing all over the eastern half of the United States and as far west as the great plains. Cork elm is found mostly in the region of the Ohio and Mississippi valleys, but not far south. A species known as wing elm is found mostly in the southern states east of Texas.

Elm is a hard wood, similar to hickory, ash, chestnut, and oak, but more resilient. It is used principally for bent wood construction. White or slippery elm is moderately hard, but the cork or rock elm is very hard and dense. Identification can be made by noting a cross section under a hand lens. The rays are very distinct to the unaided eye, heart-wood indistinct, the color, yellow.

The furniture industry, while not utilizing elm as a principal wood for construction, uses over twelve million board feet annually, exclusive of fixtures or chairs. Chairs are made from this wood on account of its adaptability in bent wood construction. A large amount of elm is made into parlor frames because of its adaptability to glue and screws. This wood can be stained to imitate birch, maple or cherry.

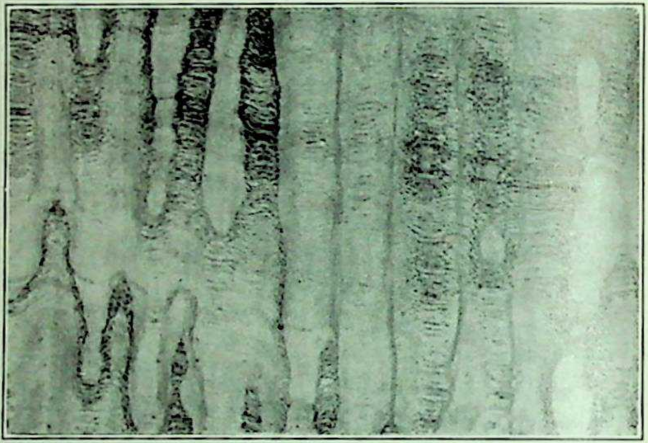


Plate VI.—Ash Burl. (A Decorative Veneer for Overlay Work.)

### GUM

Under this name we have a number of trees, known as black gum, cotton gum, red gum, water gum (Tupelo), etc. The most important of this family is the red gum which is used more than any other in furniture. It is known under such names as sweet gum, gum-tree, star-leaved and alligator wood. The geographical distribution of this wood is in the southern states, growing no farther west than eastern Texas and no farther north than the Ohio valley. This timber also grows in mixture, in the bottom lands, with ash, cottonwood and oak.

Previous to 1905 little of this wood was used in the manufacture of furniture. However, at the present time, great quantities of it are used. The red gum tree grows to a height of 150 feet and to a diameter of five feet. These dimensions, however, are unusual, and most of the timber cut is smaller.

*Identification.*—The pores of gum wood are very small and not visible without a lens. They are evenly distributed and very crowded. The rays are very distinct without a lens. The annual rings are not distinct, even with a lens, but are defined by a lighter color line. The sap-wood is white with a reddish tinge, or sometimes blue. The heart-wood has varying shades of reddish brown with dark streaks in some cases. Red gum is moderately heavy.

*Utilization.*—Red gum is used to a large extent in the interior trim of homes, apartments and office buildings. This wood, however, is used extensively in furniture to imitate walnut, since the wood is a reddish brown and can be easily stained to imitate walnut. Quarter-sawed gum, with the figure resembling that of mahogany, can be stained successfully to imitate mahogany. The majority of all pieces of furniture now called walnut contains some gum, and in some cases it is very hard to distinguish. The wood does not require filling before finishing.

### TRUE MAHOGANY

True mahogany is obtained from Central America, the West Indies, and a small area along the north coast of South America. The wood from Santo Domingo is considered the best, as the wood from the lowlands of Mexico (bay wood) and along the coast of South America is more spongy and not so desirable for cabinet work.

Crabwood, cedrela, sapeli, African mahogany, Philippine mahogany, Columbian mahogany, Libreville mahogany and white mahogany are names of a similar wood, but not true mahogany. Many of them can be finished to imitate true mahogany, while others are easily detected. Close study and a powerful hand lens would be necessary with some species to distinguish them from true mahogany.

Mahogany is moderately strong and tough and may be either close grained, or moderately so, depending on the locality where grown. This wood does not shrink or swell to any extent after seasoning, and does not readily warp or check. The natural wood is well adapted to staining and finishing in any manner. It is prized by shipbuilders and for use in store fixtures and fine cabinet furniture.

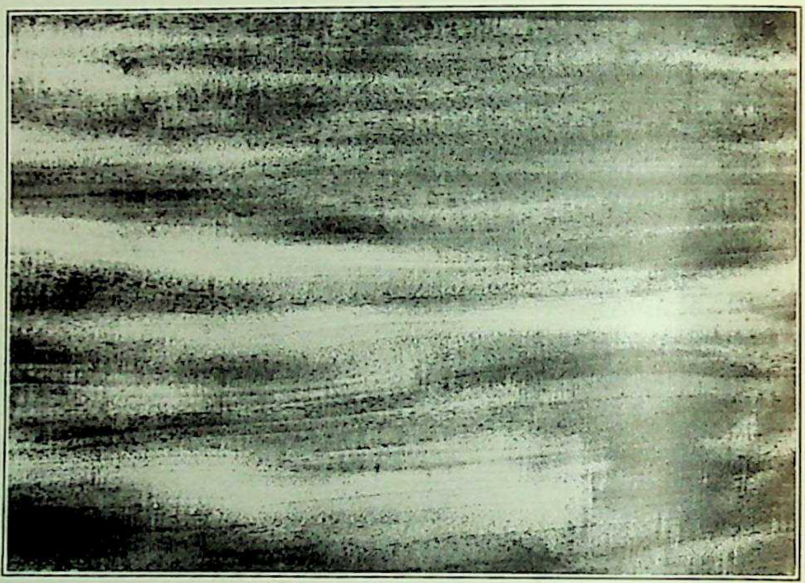


Plate VII.—Mexican Mahogany (Broken Stripe).

The figured grain of mahogany burls and crotch, taken from the crotches of trees where the limbs join the trunks, makes a very valuable veneer. Most of the mahogany used in furniture is plywood made from very thin slices of the wood to preserve the supply. The pencil stripe mahogany is very popular. The light stripes of yellowish color alternate with reddish-to-brown stripes. This figure is made by quartered cuts. The tangential surface shows an indistinct strip of wider proportions of light and reddish shades and is not pronounced. The figure is also coarse compared to the pencil stripe cut.

The real dark stripes in some mahoganies are caused by dark gum in the pores, especially African mahogany, used to a large extent by the industry at present. The pores are larger in this species and may be seen on a longitudinal or end surface.

## WHITE OAK

Of all the oaks white oak is the principal one used in the manufacture of furniture. It is found in the central Eastern section of the United States, in the Ohio River valley north to the Canadian border.

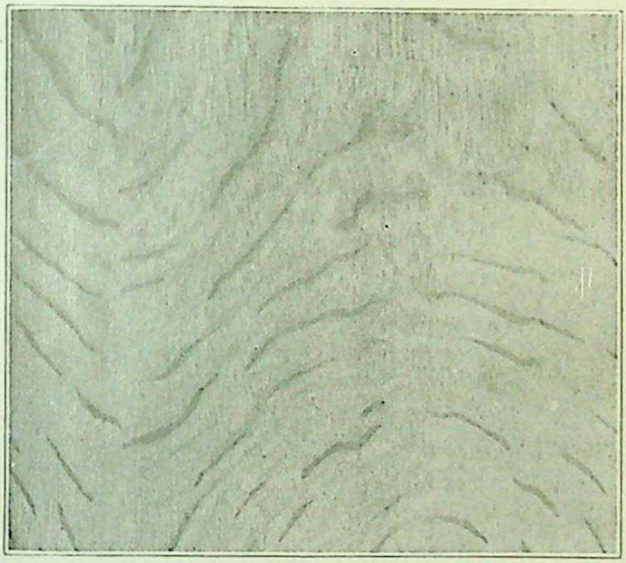


Plate VIII.—Quarter-Sawed Oak.

*Identification.*—The pores of oak are very large, especially in the spring wood, but decrease abruptly in the summer wood. These pores contain dark tyloses and this causes the dark appearance of the open pores when finished. The heart-wood is

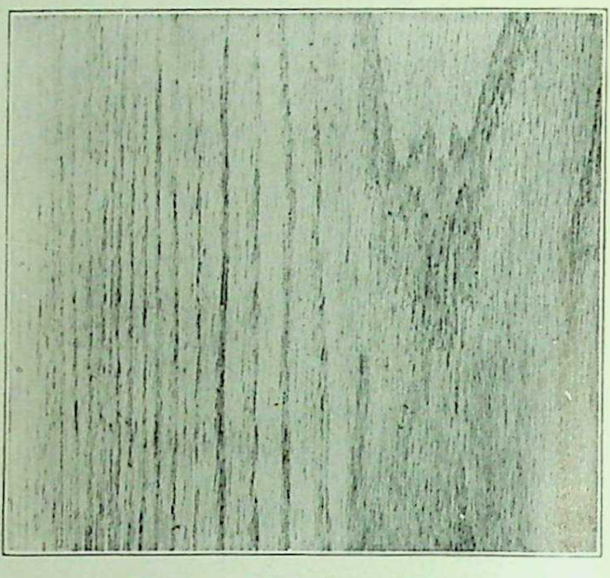


Plate IX.—Plain-Sawed Oak.

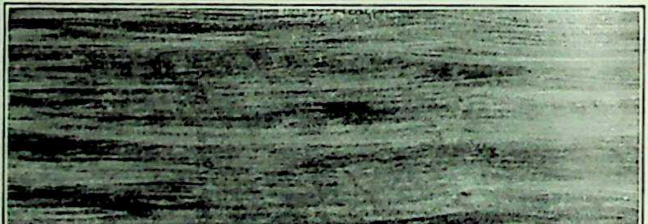
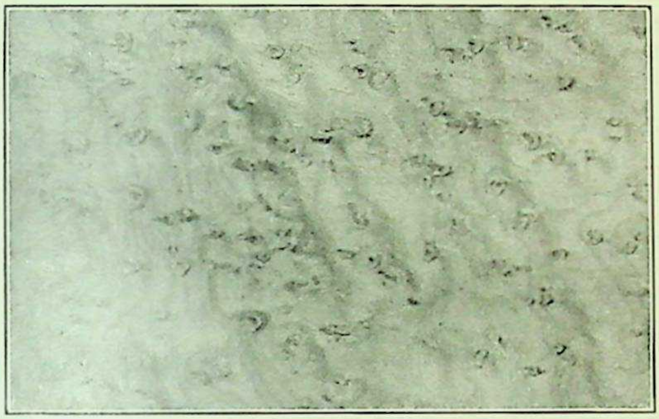
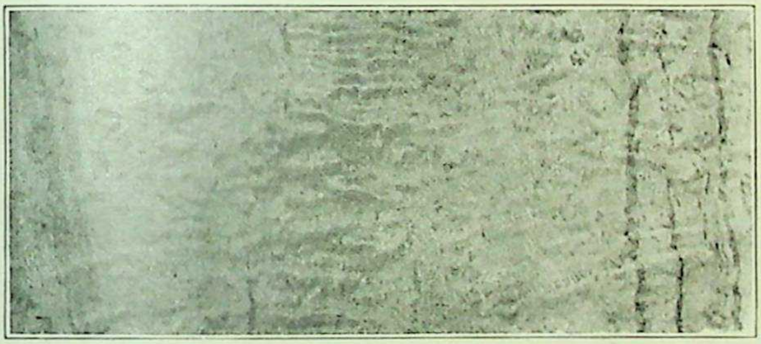


Plate X.—Pollard Oak.

a brown with a reddish tinge. The wood is heavy but varies considerable in weight. The sap-wood is often discolored by tannin and other materials that leak out of the bark. The annual rings are easily distinguishable.



1



2

Plate XI.—1. Bird's-Eye Maple. 2. Curly Maple.

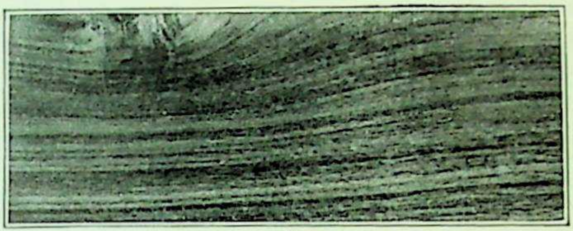
*Utilization.*—This wood was formerly used to a large extent in furniture, but owing to the present high price of the lumber and due to the fact that the styles lean to the use of walnut and mahogany, less of this wood is used in the manufacture of furniture. It is finished natural and with stain. The pores may be filled or left open. Oak can be finished in various shades of brown for fumed oak, Jacobean oak, and real dark for Early English oak; it is also finished silver gray. Furniture made from this wood is very durable because of its great strength.

### WALNUT (CIRCASSIAN, BLACK WALNUT, BUTTERNUT)

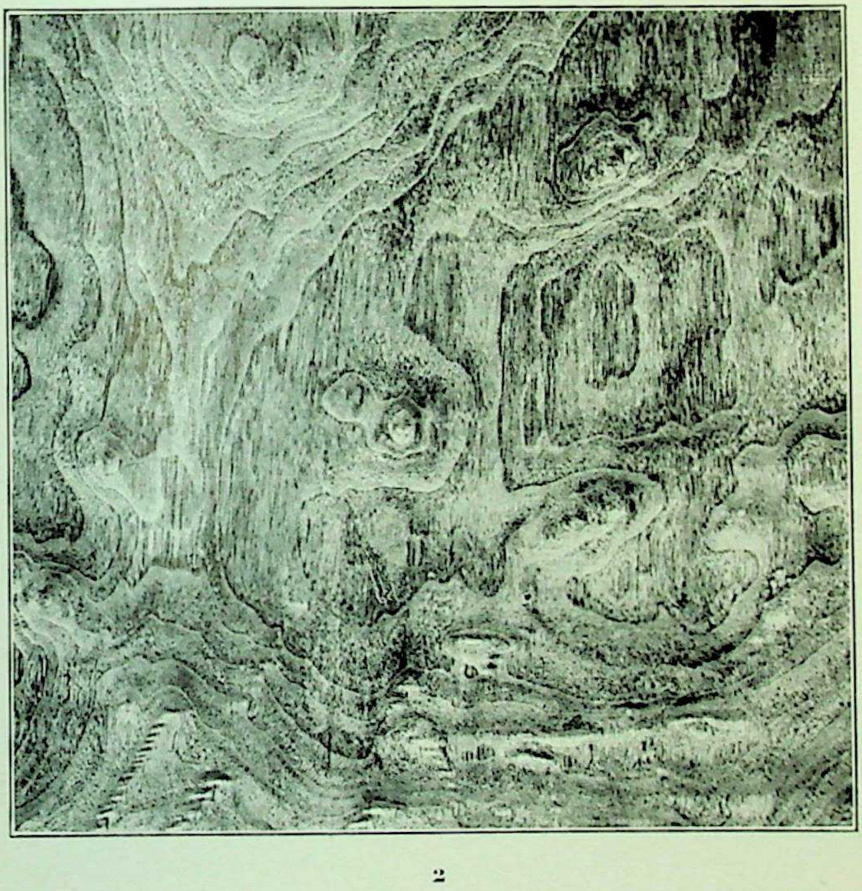
All species of walnut, including Mexican walnut and California walnut, are used in the manufacture of fine furniture. Black walnut is used mostly in the manufacture of furniture in the United States. Circassian walnut is used extensively in Europe because of its beautifully figured grain, but it is too expensive to be used in large quantities. Butternut is very scarce and not obtainable in commercial quantities.

Black walnut is very strong, especially as a post or beam, and is not excelled in this respect by any of the common cabinet woods. In hardness it is excelled only by birch and oak. This wood is straight grained, not liable to shrink, check, warp or swell after seasoning, and glues well. It takes a beautiful finish with stain or other materials.

The heart-wood is brown-to-chocolate in color and the sap-wood is white, but as the sap-wood is very narrow, about one inch wide, there is very little waste in eliminating this part of the log. The pores are large in the annual rings and, if cut on a tangent, will show a coarse figure. The tangential cut is not so popular unless the wood is figured by twists or burls. Quarter-sawed walnut gives a more beautiful figure by alternate light and dark shades. Veneer is made from all cuttings but preferably from the knots, burls, forks and stumps to get the gnarled effects.



1



2

Plate XII.—1. Walnut, Straight Grain. 2. Walnut Butt.

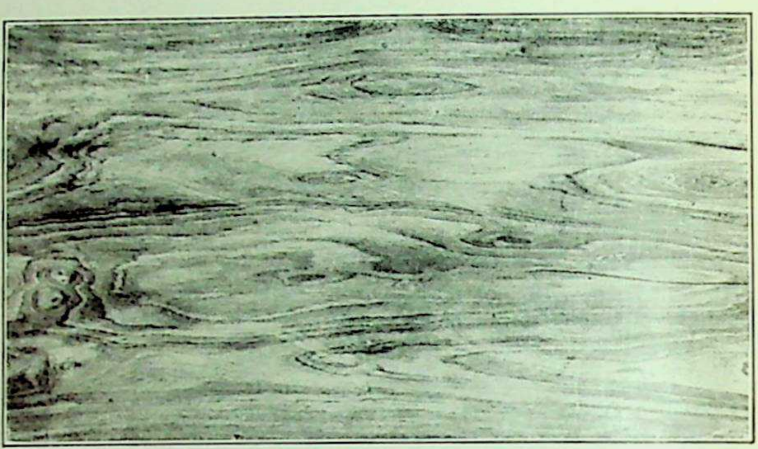


Plate XIII.—Rosewood.

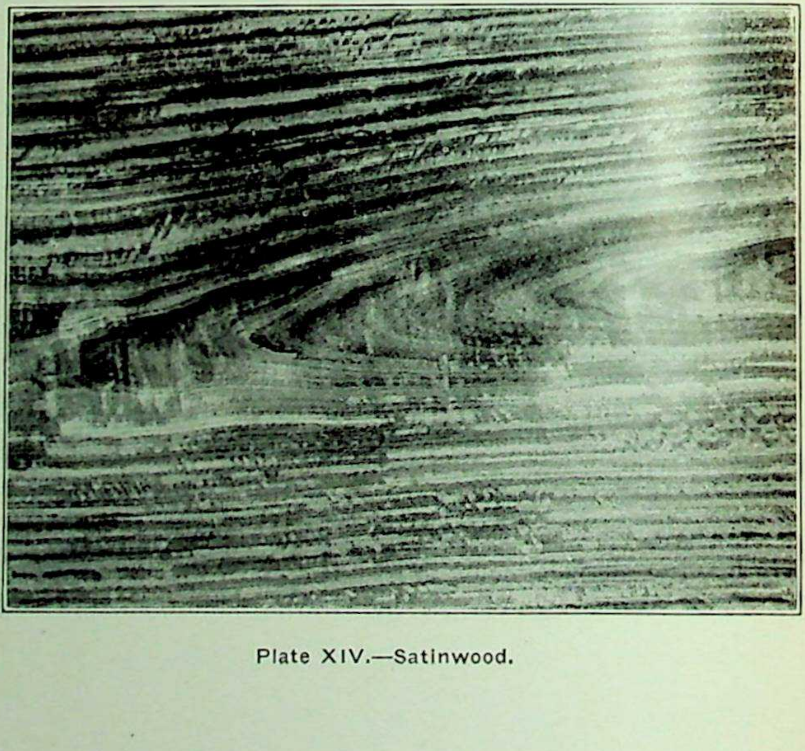


Plate XIV.—Satinwood.

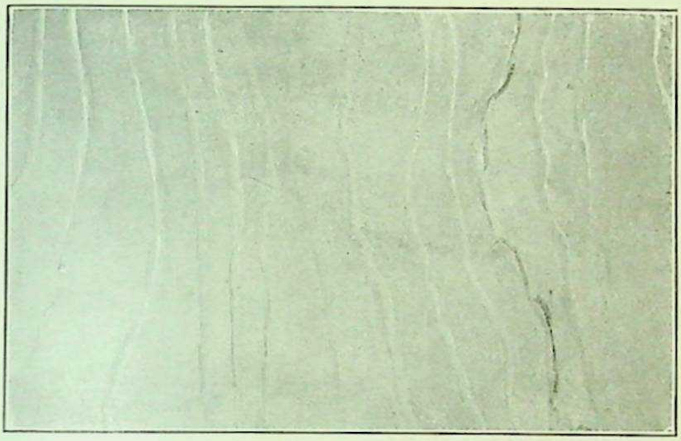


Plate XV.—Swiss Pear Tree.

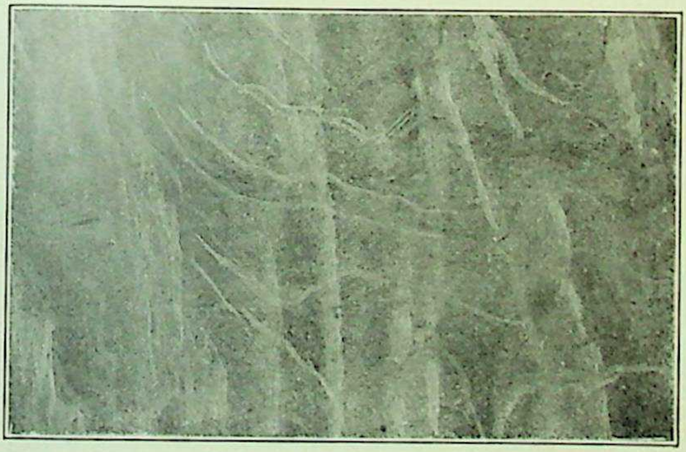


Plate XVI.—English Pear Tree.

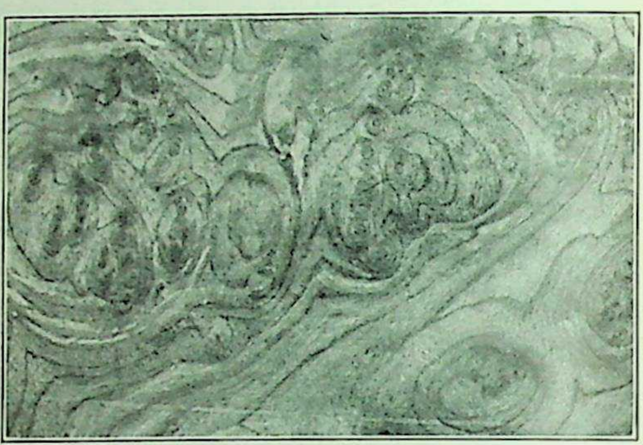


Plate XVII.—Magnolia Burl.

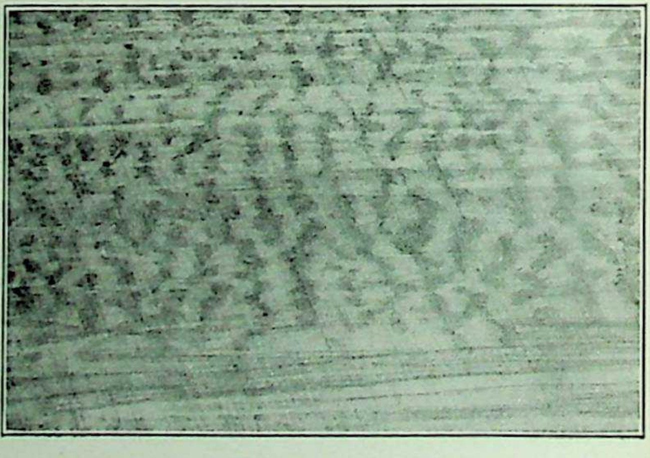


Plate XVIII.—Snakewood.

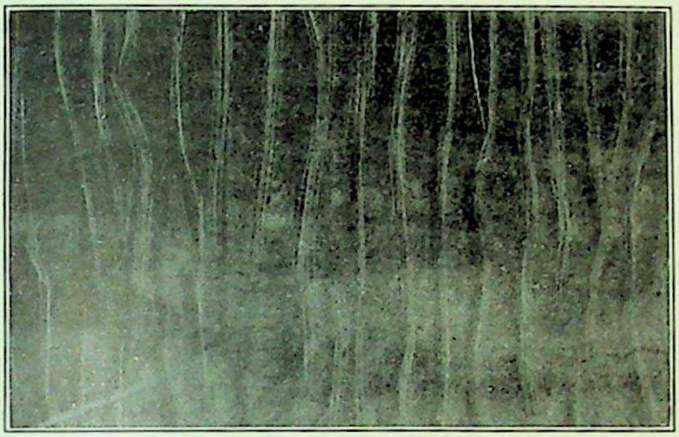


Plate XIX.—Bullet Wood.

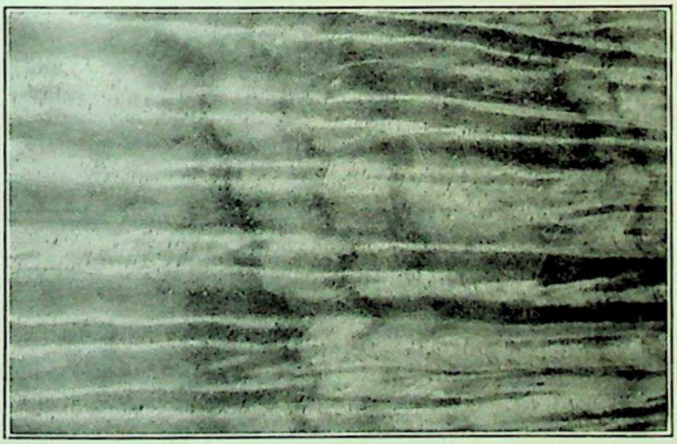


Plate XX.—Koa Wood.

# CHAPTER III

## THE FINISHING ROOM, EQUIPMENT, MATERIALS, COLORS

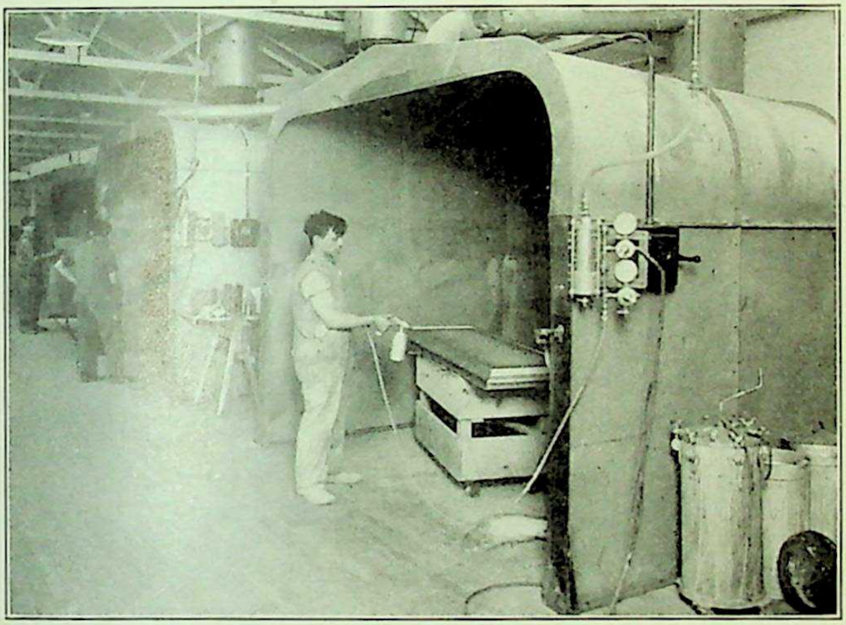
THE first thing to be considered in the construction of a finishing room is light. Nothing is more necessary to insure perfect matching of colors, and avoidance of strain on the finishers' eyes. Furthermore many skips and rubbed-through places can be attributed to poor lighting facilities. If possible, there should be light on three sides of the finishing room, and the more wall space given to windows, the better.

If artificial lighting is necessary, and it is on dark days, the room should be so flooded with light, indirect if possible, that few shadows can be noticed. If the ceiling is painted a luminus white, an indirect light will not injure the eyes even though very strong. Lights should never be hung low near the workman, as the rest of the room will appear dark and many shadows will cause poor finishing.

Heat is another requisite and the room should never fall below 75° F. while work is progressing. The heat should be evenly distributed in the room. If the exhaust equipment is on opposite side of the room, all heating should be on the side fresh air is taken in. Of course the heat of the drying room should be raised to 100 degrees or more for quick oxidization of varnish coatings or enamels. Most production factories using varnish are equipped with drying systems designed to hasten the drying of the material. If lacquer or shellac is the finishing coat, it will not be necessary to have extra heat or a special drying system. With these materials coated pieces can be placed in the drying room with just comfortable room temperature, for they dry quickly.

An important thing to consider in any finishing room or drying room is the air-tight construction, so that no dust can be carried into the room from the outside to settle on finished work and thus cause pimples and more labor to rub out. Windows should be metal frame and tightly cased. Small openings may be allowed with double screening for ventilation. An efficient ventilating system should be installed, especially in large plants.

All partitions should be built of tile or plaster board with a painted surface that can be cleaned at intervals. Tongue and groove partitions cannot be relied upon for air-tight compartments. Doors should be well built and be shut tight to exclude dust from other parts of the establishment.

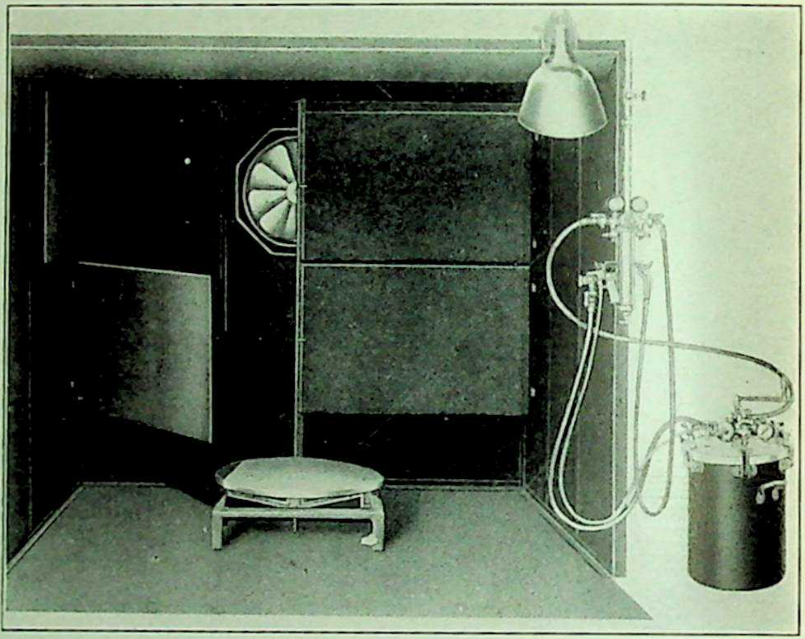


COURTESY OF THE DE VILBISS CO.

**Plate XXI.—Layout of Spraying Equipment in a Large Production Establishment.**

The size of the finishing room depends entirely on the space required to handle the output of the cabinet room without crowding. Sometimes an entire floor, or even more, is given over to finishing alone. This can be done easily where the work is all finished in lacquer, but in case of varnish finishing, the room should be divided up into several rooms of different sizes and designated according to use as staining room, sanding room, filling room, flowing room, and drying room.

The equipment, such as for spraying and drying, should be arranged to avoid waste of time in moving the pieces of furniture, when using this equipment. The same should be observed when placing sanding or rubbing equipment.



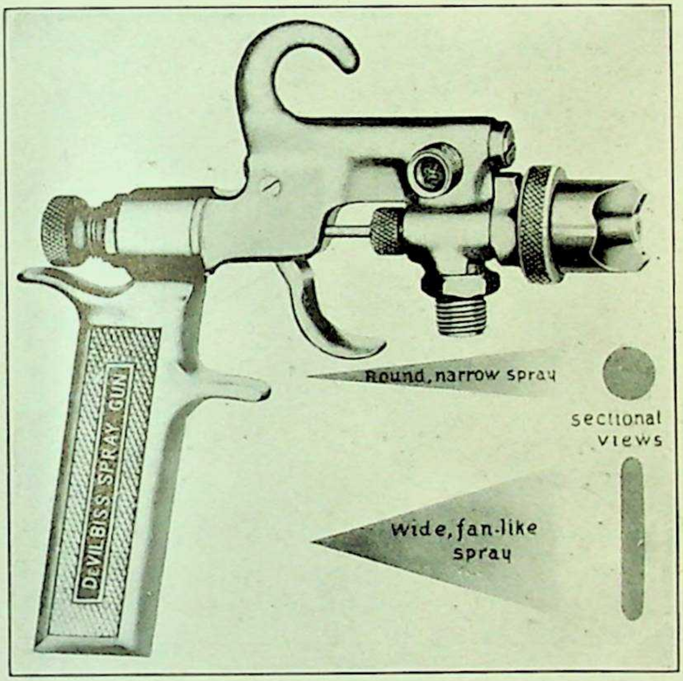
COURTESY PEERLESS PNEUMATIC SYSTEMS. INC.

Plate XXII.—Complete Spray Equipment Except Air Compressor. Note Turn Table, Light, Air Scrubber and Water Separator, Material Tank and Gun.

Cabinets should be constructed in the finishing room to hold materials to avoid waste and loss. Brushes are expensive and should be kept in a container for this purpose in the finishing room cabinet and in a "brush-keep," which can be easily made from japan dryer and thin shellac, or thin varnish. The finishing room and all cabinets should be fireproof. The same should hold for partitions and doors. Metal waste cans with tight covers should be provided for disposal of waste material.

## SPRAYING EQUIPMENT

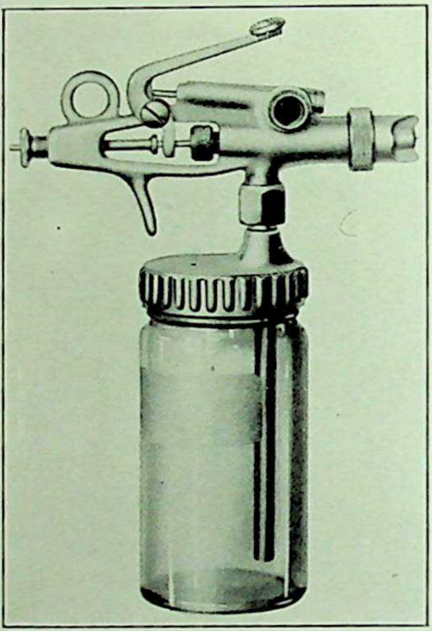
This equipment is made up of different parts made by different factories and assembled into a complete equipment. One concern will make a specialty of manufacturing the spray gun, another the compressor tank, another the motor, another the air storage tank, another the air scrubber, etc. Of course there are several manufacturers making each of these parts of the equipment and there are various styles to choose from. This field is rapidly undergoing changes and one should secure literature from the different manufacturers of this equipment if contemplating a purchase. Full directions for operation is furnished the purchaser and service is given by most of the gun manufacturers.



COURTESY OF THE DE VILBISS CO.

Plate XXIII.—Spray Gun with One-Finger Trigger.

The air scrubber, or oil and water extractor, as it is commonly called, is an absolute necessity in spraying lacquers or shellac. A very little oil in the lacquer will prevent quick drying and sometimes cause a great deal of trouble. Water of course will cause bloom on the finish and frequently causes a white film in the lacquer or shellac. A very cheap but effective scrubber can be made by cutting a piece of pipe three feet long and four inches in diameter, cutting threads on each end and capping. A tap should be made in the center of each end for the air hose connection, or the bottom tap can be on the side near the end and a tap in the bottom for a pet-cock to drain off the air and moisture. A fine mesh screen should be placed at the top, about one inch away, to prevent packing from clogging up the air line. The packing can be fine wood wool or excelsior lightly pressed into the pipe before placing the bottom cap. The



COURTESY OF THE DE VILBISS CO.

Plate XXIV.—Spray Gun with Cup Attached.

scrubber should be placed upright between the air compressor and the gun, preferably near the spray booth. Whenever there is considerable collection of moisture at the pet-cock the cap should be removed and the excelsior changed for new, clean, dry stock.

The spray booth is a necessity where lacquer materials are used, for the odor must be carried off by a fan for the health and comfort of the workman. For ordinary furniture work a booth just large enough to hold the largest piece of furniture is all that is necessary. Elevating turn tables are very handy and save time in turning the furniture when spraying.

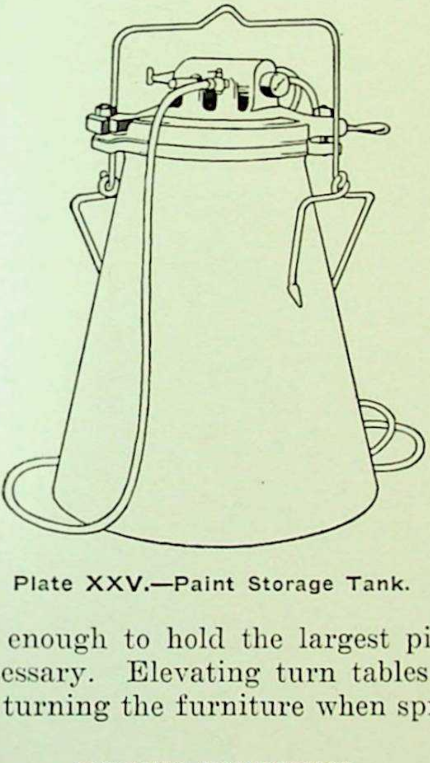
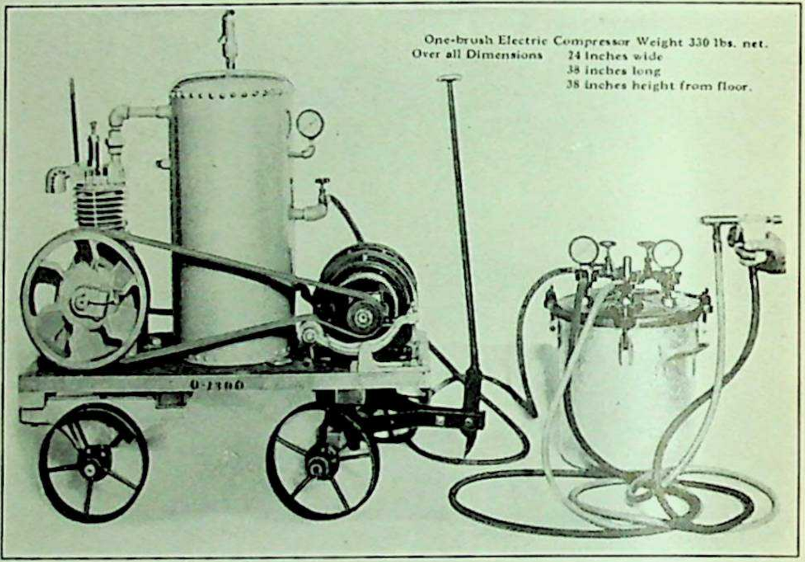


Plate XXV.—Paint Storage Tank.

RUBBING EQUIPMENT

Various kinds of rubbing machines are on the market. From a small portable machine with oscillating pads attached to one or two shoes, they are made in sizes up to a large machine that will rub surfaces as long as a bedrail or even longer. Factories use large rubbing machines for heavy duty and small machines operated by electricity and compressed air. One popular type of rubbing machine is equipped with two shoes to hold felt pads, about four inches square. These pads can be removed and sandpaper or steel wool pads attached. These machines are made with long and short stroke.

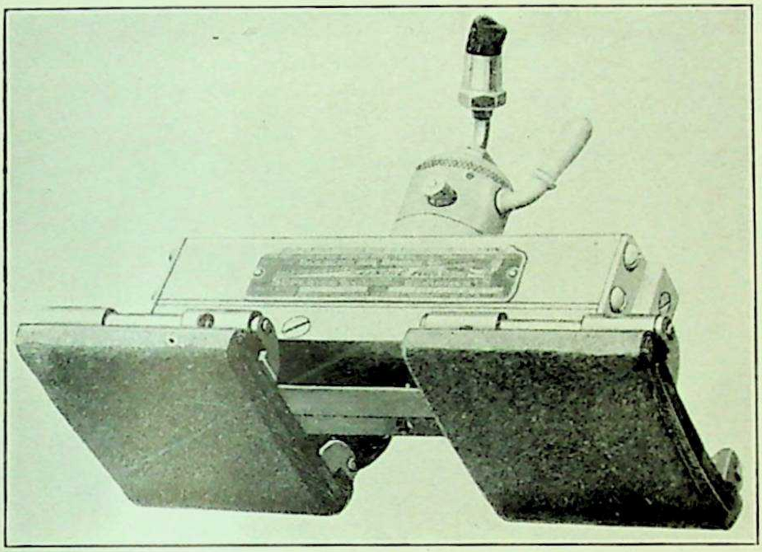

One-brush Electric Compressor Weight 330 lbs. net.
Over all Dimensions 24 inches wide
38 inches long
38 inches height from floor.

COURTESY OF ECLIPSE AIR BRUSH CO.

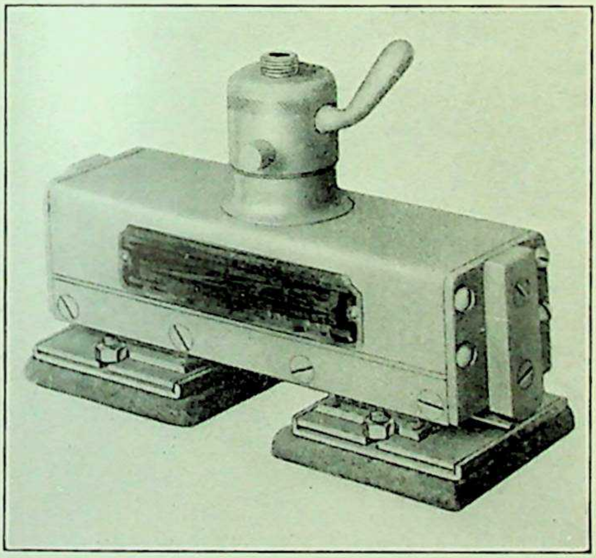
Plate XXVI.—A Portable Spraying Outfit.

## FINISHING MATERIALS

The first thing to consider is the use of stains and what kind of stains should be used in the finishing room. Aniline stains hold full sway at this time, and are the least expensive in most cases. Under this heading we have three different kinds of aniline stains, known as water, spirit, and oil stains. Water stain is by far the most desirable and the most permanent, being non-fading as a rule. Water stains mixed in the finishing room make up more than fifty per cent of the aniline sales to factories at the present time.



1



COURTESY OF PAASCHE AIR BRUSH CO.

2

Plate XXVII.—Pneumatic Rubbing and Sanding Machines. 1. With Sandpaper Attachments. 2. With Felt Pads.

Water brown, red and black are the most important under this heading. Occasionally one requires yellow or blue. Green, of course, can be made from yellow and blue, but some prefer to use malachite green.

To test a water stain for mixtures or adulterations, wet a piece of filter paper and blow from the hand a small amount of the powder over the paper. You can readily perceive whether the brown, for example, has any yellow or orange in it, or whether a red may have some black in it to make it appear deeper. Water stains should be dissolved by pouring water over them, heated to at least 180 degrees.

### OIL STAINS

Oil stains are usually sold in liquid form and a few years ago formed a large part of the stains used by factories. They are easy to apply and can be bought in standard colors, but few are light-proof, and therefore should not be used on good furniture. Some oil aniline has recently been brought out that is supposed to be light-proof, and of course would be of great advantage on lower priced furniture on account of their easy application. These stains cannot be used under lacquer successfully on account of bleeding through. A good oil stain can be made from the dry powder, dissolved in benzole or solvent naphtha.

### SPIRIT STAINS

These stains are usually sold in powder form for patching and should be kept in stock in the following colors: oak, fumed and golden, brown and red mahogany, American and French walnut, nigrosine, and auramine yellow. They are explained fully in Book IV on *Patching*. The same test for these colors can be used as with the water colors, except that alcohol is used as the solvent.

### TESTING FOR STRENGTH OF STAINS

It is well to have a standard and apply it to all stains received. In an ounce of solvent, liquid measure, dissolve one-quarter ounce, dry measure, of aniline; dip in filter paper for test. Any sediment is adulteration.

### FILLERS

Chapter V on *Fillers* gives all the explanation necessary to the proper use of fillers. Any explanation of the manufacture of fillers is useless for the reason that no satisfactory test for them has been devised without a laboratory test. The best test is to try the filler under the material to be used. If it dries hard and fills properly, and if the material you apply over it does not disturb the color or soften it permanently it is correct. Good linseed oil fillers, ground in permanent earth colors, can be used anywhere.

### FIRST COAT MATERIALS

Shellac is the most universally used of all firstcoaters and has the proper qualities of drying very hard and sealing the pores of close-grained woods. Orange shellac is bleached for what is known as "bone-dry" and cut with alcohol for white shellac varnish. Refined shellac is made from best vso and cut with alcohol for what we know as French varnish, used in patching. The wax content of the gum, similar to the comb in honey, is of course found in both orange and white shellac. Other grades of shellac, known as garnet (real dark red) and button lac (a clear red), are used in other industries and sometimes in the manufacture of stick shellac for filling holes in the finish.

A test for shellac as to cut and for purity is given below, although it is seldom one finds impurities in shellac today owing to the Federal Trade Commission ruling that all shellac should be labeled "Pure Shellac," provided no adulteration is used, and "Substitute Shellac," if other gums were mixed with the shellac when cutting. There is as much need for some rule regarding the cut of shellac as for testing for impurities. The purchaser as a rule has no adequate means of testing shellac for the number of pounds of gum per gallon of alcohol.

In testing shellac the finisher usually takes into account the different qualities that make shellac an ideal firstcoater or a coating for the finishing operation. Easy tests can be made by anyone to determine adulteration or the number of pounds per gallon of alcohol. Two or three such tests are given below.

### TEST SHELLAC FOR ADULTERATION

The U. S. Bureau of Standards gives the following test for non-volatile matter. The process is simple, but must be done accurately. Use two small friction can lids from a pint or quart can, clean perfectly and dry in an oven. Prepare two vials (common drug store variety) with tight corks. After agitating the shellac sample, pour a like amount in each vial by weight and weigh. Now weigh accurately each of the tin lids and then pour about thirty grams of the shellac from each vial into each lid. The determination is made in duplicate to avoid error. The following tabulation will suffice to show how the test is made:

| | | |
|---|---|---|
| Weight of bottle before pouring out sample | 45.45 | grams |
| Weight of bottle after sampling | 42.75 | |
| Weight of liquid shellac in dish | 2.70 | |

The dishes containing the shellac are placed in an oven of 212 degrees and left for two hours or more, at which time all the volatile matter will have evaporated.

| | | |
|---|---|---|
| Weight of dish or lid plus non-volatile matter | 20.42 | grams |
| Original weight of dish | 19.39 | |
| Weight of non-volatile matter in dish | 1.03 | |

Applying equation, $\frac{1.03}{2.70} = .381$, or 38.1% of non-volatile matter or gum. Hence the shellac varnish contained 62% alcohol and 38% shellac gum if pure.

*Determining the Shellac Cut.*—After finding the percentage of gum in the varnish, let $y$ equal the percentage of non-volatile matter and $x$ the cut, and with the equation below, figure the cut from any shellac sample.

$x = \frac{6.8y}{100y}$, substituting we have $x = \frac{6.8 \text{ x } 38.0}{100-38.0} = 4.17$ lbs. per gallon.

The following table given by the American Society for Testing Materials will give excellent help in determining the cut of shellac by weighing and comparing it with this table. This table shows the relation between orange and white shellac in cut and weight.

| Cut in pounds per gallon. | Weight in pounds per gallon. | |
|---|---|---|
| | Orange | White |
| 3.0 | 7.50 | 7.55 |
| 3.5 | 7.60 | 7.64 |
| 4.0 | 7.69 | 7.74 |
| 4.5 | 7.77 | 7.79 |
| 5.0 | 7.83 | 7.89 |
| 5.5 | 7.92 | 7.95 |
| 6.0 | 7.97 | 8.00 |

The slight discrepancy is the result of insoluble material taken out of orange shellac when cutting and the fact that from two to five per cent moisture is excluded by heating the shellac to 212° F.

*Test for Gum Adulteration.*—Coat a panel with orange or white shellac of any desired sample on one side and with a known quality sample on the other; place the panel in a jar containing turpentine or solvent naphtha and allow to stand for a few days. If the coat becomes tacky or soft, the varnish contains adulteration of gums commonly used in oil varnish. If the shellac varnish contains brittle gums, the results will be manifested by chipping off a varnish coat over the shellac by alternate heat and cold changes. Coat a panel on one side with a known pure sample of shellac; on the other side coat with the sample you wish to test. Allow usual time for drying, sand, and coat with a rubbing varnish of good quality. After this varnish is hard, place it in an oven for thirty minutes and then place in a refrigerator, or if in winter, place outside for a few hours. Repeat this several times and if impure, the undercoat will break away separating the bond between it and the varnish coat. It can be noticed by light grey patches under the varnish.

## RUBBING VARNISHES

About the only tests of any value that can be made by the finisher on rubbing varnish, will be actual test panels submitted to the test likely to be encountered by the furniture in use. The wide use of nitro-cellulose lacquers indicates that the oil varnish made to-day may not be used as a production finishing material in a few years.

Varnish intended for use on dining room furniture must of course be a tung oil varnish, waterproof, and very hard to resist hot dishes. Prepare panels as you would your furniture with stain, filler, and thin shellac coat, and then a coat of your sample. Allow ample time for drying and then rub to desired finish. Submit this panel to pressure and to 90° F. heat by placing a plate in an oven at 100° F. for an hour and then place the plate on the varnish over a cloth. If the varnish prints it is not suitable for table tops.

Other varnishes for ordinary rubbing can be tested for their rubbing qualities and ability to resist pressure without marking in a similar manner, but remember at least a week should be allowed after finishing before making the test.

## NITRO-CELLULOSE LACQUERS

The test of lacquers is important. Of late there has been a great deal of trouble in some factories as a result of lacquer blooming and turning gray after a few weeks. This is mostly because it is rubbed too soon.

Thinner for lacquer should always be purchased from the same concern making the lacquer, for the thinner must be in the same balanced proportion if the lacquer is to work correctly after thinning. Use of the wrong thinner will sometimes throw the cotton out of the solution entirely. Some finishers think they can make their own thinner and try mixing alcohol, acetone and toluol, etc., in various proportions, and of course waste more time and spoil more work than could ever be saved in this way. One thing sure to be remembered is that a great amount of lacquer on the market is little better than varnish for heat resisting and pressure marks. A real good lacquer should not mark from dishes, unless extremely hot, and pressure from packing should not mark it. Lacquers that mark easily contain a large amount of spirit soluble gums and not sufficient cotton film.

## COLOR AND COLOR HARMONY

Every furniture finisher should have a working knowledge of color and color harmony. There are certain fundamental facts in regard to color that are invaluable. The normal colors are the colors of the spectrum, which may be seen when a ray of light passes through a glass prism. Blue, red and yellow are primary colors, and the combining of these colors produce the secondary colors, orange, violet and green. They are formed by combining two primaries, yellow and red producing orange; red and blue producing violet; and blue and yellow producing green. In addition to these are the colors known as tertiary colors, formed by mixing a primary and a secondary together. For instance, the product of yellow and orange is yellow-orange; red with orange gives red-orange, etc.

Luminous or warm colors are red, yellow, orange, light green and light tones of somber colors. The somber or cold colors are blue, violet and dull tones of luminous colors. Normal gray is black and white mixed in various proportions. Tones are gradations from great intensity, weakened by the addition of white or deepened by the addition of black. Hue is the change produced in a pure color by the addition of a smaller quantity of another pure color.

*Color Harmony.*—Colors appear different when placed side by side. For example, in a red object half in sunlight and half in shade, the red appears more brilliant in the sunlight as a result of the color absorbing the complementary colors, yellow and blue, in the sun's rays, and giving off more red or intensity of this color.

If primary colors are mixed in unequal proportions or of different intensity, they will produce gray. Any given color may experience many modifications, so as to appear quite different from what it really is, according to the circumstances under which it is viewed. Make a test with red, for example, and note the following facts:—

Red, in contact with blue, appears yellower.

Red, in contact with green, appears purer and brighter.

Red, in contact with black, appears duller.

Red, in contact with white, appears brighter and lighter.

Red, in contact with gray, also appears brighter and lighter.

Thus the same red may appear many different reds according to circumstances under which it is viewed, being modified in intensity and tone. If a dark color is placed beside a lighter color, the dark color appears deeper in tone and the light color appears lighter. The quality of light, whether diffused sunlight, diffused daylight or direct sunlight, which illuminates the colored object, modifies the tone and hue of the color.

*Color Modification.*—A polished surface over a color gives a brighter appearance to any color and a dull surface the reverse. This is witnessed in the plumage of birds, and some flowers, like the pansy. For this reason nothing can be matched perfectly in wood finishing by staining, without first flowing a gloss coat over the stain and then making a comparison for color and shade. In matching an enamel finish, more care must be exercised in matching the color, for different number of coats, dull or gloss surface and light reflections all affect color. Many pieces are refinished as a result of not being able to match color for patching or refinishing of one piece in a suite. The age of the finish also modifies the color and matching becomes a difficult accomplishment. This modification is noticeable on both opaque and transparent colors.

# CHAPTER IV

## STAINS

NO GENERAL rule can be given for making stain formulæ for different kinds of woods that would be of much value to the finisher. Scarcely a piece of furniture that is made wholly of one kind of wood finds its way into the average home, and for that reason a different stain formula must be made for each kind of wood in order to match. A skillful manipulation of stain makes gum a good match for walnut, and birch is used more to imitate mahogany than anything else. Color is no obstacle in imitation. If the grain and figure are similar, the stain can be made to imitate perfectly. Do not try to imitate one piece by staining another piece that has a figured grain entirely different, as no imitation will be produced and it will only show poor judgment. Care must be exercised, if a cabinet has more than one kind of wood in the exposed surface, to know beforehand which wood takes the most color, as this should be stained last after weakening the mixture by addition of solvents.

The history of stains used today is a history of the coal tar aniline industry. This industry developed about the time of the Civil War. At first the dye was used as vat dyes for coloring fabrics. The dyes made from coal tar distillation are divided into three classes so far as they concern wood finishing: water aniline, spirit aniline and oil aniline dye. Some dyes which are soluble in water and used mostly this way are also soluble in spirits, as for instance, auramine yellow and Bismarck brown, which are mostly used in spirits. The manufacturer usually labels these stains as to how they are soluble. Some oil anilines are soluble in spirits. The finisher should be familiar with these colors, so that he may distinguish between them readily.

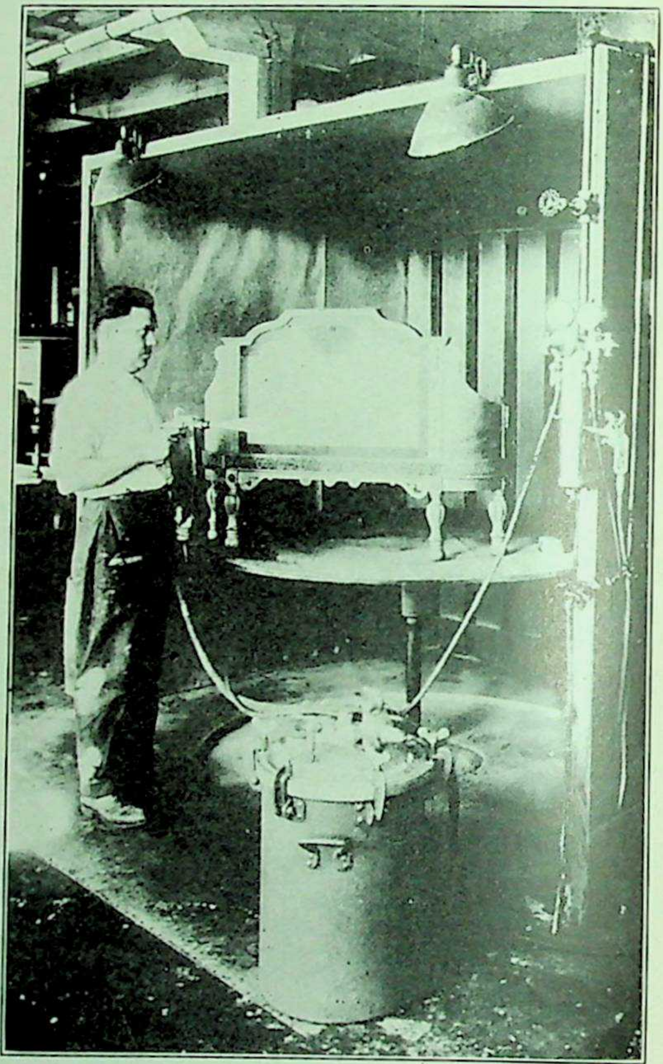


Plate XXVIII.—Spraying Stain.

## CHEMICAL STAINS

Acid water stains formed one of the principal materials for use in staining before the advent of aniline dyes. Chemical stains are dangerous to use (many finishers would refuse to work with them), and they require more time to use than aniline dyes. Tannic acid, five per cent solution in water, produces a light brown effect, but is usually used on woods low in tannic acid content. A solution of bichromate of potash, 4 ounces to a gallon of water, is usually brushed over this to produce the proper shade of brown for walnut, etc. Nitric acid, sulphuric acid and picric acid in a twenty per cent solution produce a yellow shade on most woods. If used full strength it will produce brown shades. Muriatic acid will produce black and when reduced with water, will make any shade of brown. Bichromate of potash and carbonate of soda when dissolved in water will produce different shades of brown and yellow on different woods. Sulphate of iron will produce black on some woods and gray on others.

Permanganate of potash was the principal chemical stain of former years, and mixed in proportions of from four ounces to eight ounces to a gallon of hot water, would produce most all shades of brown desired for oak and walnut. Two or more coats could be brushed on if the first coat was not dark enough. Ammonia in strong solution is used for fumed oak. Fumed oak gets its name from the process of fuming by placing the pieces to be fumed in a tight room and placing therein a vessel containing strong ammonia. The fumes of the ammonia by chemical action give a rich reddish brown to the finish. Brushing ammonia on is next to impossible as the strong fumes attack the membrane of the nostrils.

## PIGMENT STAINS

Pigments for mixing with water form a very small part of the coloring material for furniture, but distemper colors (ground in water) for graining can be obtained in the following colors:

drop black, Prussian blue, ultramarine, all the browns, as raw and burnt sienna, raw and burnt umber, chrome green, chrome yellow, English or American vermillion, fast red, turkey red, Tuscan, Venetian and zinc oxide (white).

These pigments are mixed with hot water, with a little glue for a binder, and usually a bit of aniline is added to give a true tone to the color, which is then mixed thoroughly with mortar and pestle or ground in a mill. Being opaque, they are of little value on close-grained woods, such as gum and birch where a transparent finish is desired. In fact they are not used except where an imitation of a figured grain is desired or for a gray effect on oak or walnut, using the white pigment to fill the grain.

Pigments ground in linseed oil or japan form the coloring matter for all paints and enamels and comprise the same list as shown in a previous paragraph, and many more, including the lakes and ochres. The japan colors are used when a quick drying color is desired. Below is a reasonable list of colors ground in oil and japan—enough for decorative use in the average shop or factory.

Chrome Yellow, Light
" " Medium
" " Dark
Yellow Ochre
Burnt and Raw Umber
Burnt and Raw Sienna
Vandyke Brown
Permanent Red
Venetian Red

Prussian Blue
Ultra Marine Blue
Lamp Black
Drop Black
Rose Lake
Chrome Green, Light
" " Medium
" " Dark
Zinc White, Flake White

### STAIN SOLVENTS

No exact rule can be given for dissolving stains. The most important thing for the inexperienced to remember is that few stains of the same colors from different houses are the same in strength. A quantity of dry aniline of any color can always be obtained from any stain house, by submitting a sample for matching. Accurate tests for strength of color can be made by dissolving a given amount of color (say one ounce) into from one quart to one gallon of solvent. Value can be found only by comparison. This means that the stain giving the darkest shade of the same color with the same proportions of solvents and color can generally be considered the best value. This does not always hold good. For instance, if you have a straight brown aniline to match and ask another house to duplicate it, and find after examination that instead of being a true brown, it is a mixture containing an addition of nigrosine to make it darker, your match will only be temporary. If some of the colors fade faster than the others, or if you add some other color, such as red, to both stains, you will find they appear different again. If you wish to test a powder stain against adulteration or mixture, you can do this by saturating a small piece of filter paper with your solvent and blowing over this from your hand a small amount of the powder stain. Hold the paper close to your hand, pitched just a little toward you. You will find that the colors will all show up, if it is a mixture, as the small particles separate and fall on the wet paper at different spots. Of course, in spirit stains mixtures are necessary for many wood shades and a test of this kind is not always a proof that you are not getting good value or the proper color. Water stain and oil stain powders are also frequently mixtures.

Only in cases where you are offered a brown stain at a better price and represented to be a pure brown and found to contain nigrosine, is there an opportunity for complaint. Use water for tests on water stain, a denatured alcohol for spirit stains and benzole for oil stain tests. Dissolve a certain quantity of each color in the above solvents (given amount), keep these tests in air-tight jars, fully labeled with name of powder stain, from whom it was purchased, and the proportions of stain and solvent. Then you will have no trouble in making comparisons or keeping your stain formulæ balanced correctly. Nothing can be gained by having on hand several brands of stain of the same color and using first one and then another, and naturally never getting quite the same results. Stains are cheap and cover a vast amount of space (500 sq. ft. to a gallon) when mixed correctly and used judiciously. One good reason for using water stain is that oil or spirit stains will fade or change color on exposure to light.

A few formulæ are given elsewhere in this volume for producing the accepted shades on different woods, but most stains are brown or reddish brown. The proportions of powder to the solvent vary according to the color used and the shade or tint desired. As mentioned previously, you could first dissolve at the rate of four gallons of solvent to the pound of aniline and intensify by addition of black, or water for a lighter tone. Brown is the base of most stains and thus trying brown in the above proportion, you can shade to the desired color by addition of black or red, sometimes yellow, to give the color you want. This is applicable to any water, oil, or spirit stain.

The drying qualities of the different classes of stains differ considerably, and the penetration, evaporation and chemical reaction of the solvents differ. The stains dry in this order: spirit, water, oil. Under ordinary conditions, where the temperature averages 80° F., the time allowed after staining before the next operation should be: Spirit stains, two to four hours; water stains should dry in twelve hours, and oil stains in twenty-four hours. This is not an arbitrary rule. Many finishers do not allow this length of time for drying at any time and appear to get good results. Others are having trouble all the time with varnish not drying and checking as a result of not allowing sufficient time for stain and filler to dry. Factories do not take chances and allow ample time for drying to avoid trouble.

If naphtha (VMP), or 158-degree, is used in small proportions with alcohol when dissolving the spirit stains, the drying process can be slowed down considerably and easier application will result. VMP naphtha is also used with a mixture of C. P. benzole for dissolving oil aniline. Of late some use toluol or xylol (coal tar products) in dissolving oil stain, and these are reasonably slow drying, next to naphtha. No oil stain formula should be made without benzole as this is the most penetrating oil stain solvent. In mixing the oil aniline, as shown in the next few pages, several items are used, such as asphaltum and rosin oil, not used in other stains.

Oil Aniline is a derivative of coal tar distillation, and is one of the principal classes of dyes used in furniture finishing. All the prepared oil stains contain oil aniline stain for coloring matter. These stains are also dissolved in turpentine, benzine or benzole, as one of the principal sources of stains in small shops, being easily made and when dissolved with a solution containing a considerable amount of benzole, will penetrate the filler when refinishing.

Below is a formula for making a good brown mahogany oil stain, and the other stains that can be made from this formula:

### BROWN MAHOGANY OIL STAIN

¼ lb. oil yellow
1¼ lbs. oil orange
⅜ lb. oil red
3¾ lbs. oil black
5 gals. benzole
5 gals. solvent naptha
¼ gal. gloss oil or varnish
2 gals. asphaltum

### RED MAHOGANY OIL STAIN

To the above formula add:

1 gal. of benzole
¼ lb. oil red
1½ pint asphaltum

### WALNUT OIL STAIN

To the original Brown Mahogany formula add:

¼ lb. oil yellow
1¼ lbs. oil orange
2 lbs. oil black
5 gals. benzole
5 gals. solvent naphtha
¼ gal. gloss oil

### GOLDEN OAK OIL STAIN

1 gal. walnut stain
2 oz. oil brown
½ pt. asphaltum
1 gal. benzole

When considering the effect of different colors on many different hard woods, it will be well to mention again that brown stain is employed more than all other colors combined. Oak is finished brown with few exceptions, never red, and occasionally silver gray. Mahogany was originally finished red, but of late mostly brown, and we see an occasional piece in Sheraton. Walnut is sometimes bleached and finished natural, or with a light brown stain and shaded brown. This wood was at one time the rage, finished natural with fiddle back, burl or bird's-eye figure to the grain. Birch is used successfully to imitate mahogany or walnut by using either a mahogany or walnut stain. Gum can be used in the same manner, except that the real dark gum does not imitate a red mahogany. Choose either red or white gum.

If a piece of furniture contains walnut, dark gum and birch, and an American walnut finish is desired, a great deal of testing will be necessary to get an exact match. The walnut is open-pore, the gum and birch are small pore. The same stain will penetrate further in the walnut, while the birch is very light in color and will need a darker strength of stain than either the gum or walnut.

The best procedure is to stain the walnut first to the exact shade desired, increasing the strength for the gum and still more for the birch. First, mix the formula with water, oil or alcohol as the solvent, taking four ounces to the gallon and then diluting, if necessary, to get the proper shade on the walnut. It will seldom be necessary to have a strong solution like the above on dark woods like walnut or dark gum. The addition of a trace of nigrosine in water or alcohol, or oil black to your formula will, with few exceptions, give you the proper shade for your gum wood and more strengthening with black will serve to match the birch with the walnut.

Of course, care must be exercised in the trial of these colors before using them, and the method previously mentioned, of shellacing over a small portion in strong light to test color, must be used to insure proper results. Be careful always in adding black to other colors, for little is required.

In many cases no stain is used on walnut wood and little on gum. The filler, mentioned in Chapter V, gives the proper shade to these dark woods and especially when they are light in tone. Of course in such woods as gum and birch, where the grain is very close and little filler is taken into the pores, a stain is usually necessary. One thing to remember is that the filler will not change the color materially, but merely give it a deeper tone, and if your woods match in color before you apply the filler, there should be no material difference after its application. A little more color may be added to the filler, if desired, when filling the woods with a closer grain. The filler is made with a tone of the same stain color of a little darker shade. Factories have a standard stain color for the different woods and a standard shade of filler for each finish.

### THE USE OF WATER STAINS

If one were to visit buildings where woodwork has faded out to a sickly yellowish brown, or notice the furniture or pianos in homes where light has faded out the stain on certain portions, causing a different shade from the rest of the piece, he would become an advocate of water stains, proof against light.

Water stain should be used on all pianos, phonographs, radio cabinets, fine furniture and woodwork exposed to light, especially direct rays of the sun. Water stain should be used also in refinishing these surfaces when a practical and long life of finish is desired. Water stain made from aniline dyes should always be used under a lacquer finish to prevent the bleeding of stain by the lacquer. This cannot be prevented with any other kind of stain excepting the old chemical stains.

*Mixing.*—The only rule to go by and be sure of obtaining the desired results with water stain is to make your own formulæ to suit your individual needs. Many formulæ are given in different publications and trade periodicals for all the different standard finishes, but in order to get the desired results with these formulæ, you must use the same make of dye and chemicals as were used in producing them. This would require the names of the different manufacturers or jobbers, an impossible task. Most of these formulæ are given with the idea of selling a particular brand of stain, and if the reader wants these formulæ he can obtain them through the manufacturer or jobber of finishing material. Also, many of these formulæ are complicated and use several colors where one or two would suffice. How can you make a standard formula when different dye houses have a particular strength of dye in each color, some stronger than others, and in case of a mixed stain, many times the deep tone is made with addition of nigrosine instead of a stronger color? It is, therefore, impossible to give a definite formula that will work for all the different stains you are obliged to use from the several houses making or selling them.

A knowledge of colors and color harmony will greatly aid one in the matching of any finish with water stain. The manufacturer of aniline has greatly helped the finisher by furnishing samples of the different dyes for the finishing room. For instance, the following colors, soluble in water, are about all you would ever use, and some of these but seldom: Red (crimson), brown (tobacco), auramine yellow (lemon), nigrosine crystals (jet black), fuschine red (scarlet), malachite green (blue green), and standard walnut. You know that red, blue and yellow are the primary colors and that nigrosine will deepen the tone of any color by addition of small quantities of it to any formula. You could easily leave green and one of the reds out of the above list, for blue and yellow make the green. Yellow is seldom used except in the lighter shades of brown, and fuschine red, being very bright in color, is employed very little in ordinary wood finishing.

To give some idea as to the manner of mixing these colors for the average finishing job, say for a walnut of medium shade where quality is desired, water brown is dissolved in hot water, about four gallons of water to the pound. This alone will make an excellent shade for walnut. If a lighter shade is desired, a small amount of auramine yellow and water red can be added and the solution thinned down by the addition of water. If a darker shade is desired, add water nigrosine to this solution in a limited quantity. This stain may be applied to any wood where walnut stain is to be used and may be strengthened or weakened as desired. This stain can be used on mahogany for a light brown mahogany finish, and indeed, is used for most mahogany woods, there being very few red mahogany and dark mahogany finishes.

If a reddish cast of brown stain is desired for red mahogany finish, acid water red can be added to the above mentioned brown stain after it is reduced one-half with hot water. The reduction is sometimes necessary before adding any more color to prevent overloading the water with stain. The most economical way to dissolve stain is never to use more powder than can be easily dissolved by the solvent (water in this case).

If a light brown stain is desired, the addition of some auramine yellow to the formula and a weakening of the original solution will give this effect. This is sometimes desired for walnut for the reason that the wood is dark before the application of the stain, also for oak when a golden oak finish is desired. The original formula, with a little doctoring, is suitable for Jacobean oak, early English, fumed oak, weathered oak or Flemish oak, all being different shades of brown. See Book III, Chapters I and IX.

## APPLICATION OF WATER STAIN

The application of water stain is sometimes difficult, especially where you must use short strokes and on panels where your brush comes up against abutments, for water stain should be brushed out and not wiped. Some finishers form a practice of wiping all stain, but this practice will cause dark streaks in the finish if you are using water or spirit stain. A long bristle brush with hairs reasonably stiff and from two to four inches wide, set in rubber, should be used for water staining. A brush with bristles set in glue will soon shed its bristles when the water has softened the glue. The same applies when applying alcohol stain. Take all drawers out of cabinets, also remove all movable parts and stain each separately.

Apply the stain in a sweeping stroke with the grain of the wood, which nearly always runs lengthwise of the piece, keeping all surfaces horizontal if possible. Work back and forth with the brush without lifting until your brush becomes too dry to cover the surface well with stain and then dip the brush half into the stain solution and apply again as before, with the grain of the wood, back and forth, from the farthest edge toward you, until the surface is covered. Before the stain is thoroughly set, brush out without using more stain until the surface has assumed a dull appearance. At this stage stop brushing and allow to dry. Take the next piece and repeat this operation on it, remembering always to brush with the grain and cover all parts of the surface equally, to insure a uniform surface in color. Above all be careful not to cover the same surface twice, or you will be sorry to find that this surface will be darker than the rest, and will have to be washed out, or the balance of the piece must be stained over to match.

Carvings on refinishing jobs offer an obstacle to water stain, for the reason that the old finish is usually not removed well in the carvings. This also applies in frets, or grilles, and flutes or mouldings. Wire brushes can be used in these places, or steel wool can be employed, when the stain will not penetrate, and 3/0 garnet paper can be used to sand in stain on places that are flat. Just enough sanding to allow penetration of the stain is sufficient as more than enough sanding will cause a darker place. The sanding or rubbing with steel wool can be done after the stain is applied, and when it draws away from the surface, for in this way it can be noticed readily where the stain does not penetrate and can be corrected at once. Sometimes grease or oil is found to be the cause of the stain not penetrating; a little benzine or naphtha will clean this off before you apply the stain. Both sides of a flat piece, like a door or shelf, should not be stained at the same time unless special racks are provided for carrying them. At least one hour should be allowed before staining the other side and then it may be laid on a rack to dry.

When staining carvings or recesses of any kind, it is better to have a little less stain than customary, so that no surplus will be left when through brushing. If you get a surplus on any recess, pick it up quickly with waste or some absorbent material.

A little caustic soda is sometimes added to a formula to allow better penetration, but this is necessary only on removed surfaces. A little bichromate of potash can be used, about one to two ounces to the gallon, if desired, instead of the soda, and will be more satisfactory.

Sometimes it will be found that, after cooling, the stain will precipitate to the bottom of the container. When used again, the stain should be heated again and the container agitated or the stain stirred thoroughly. It will be found that the water will dissolve more stain when hot and for that reason the stain should always be mixed hot to get the full strength of the formula, then allowed to cool before applying, so as not to affect veneers or glue. Stone crocks are better containers for water stain than tin cans or iron buckets, as they are neutral chemically and the latter are not.

## APPLICATION OF OIL STAINS

Oil stains can be applied with a spray gun or by hand brushing, but unlike water or spirit stains, must be wiped with waste or soft clean cloths. In mixing oil stain it is well to strain the stain before using, and after it has been thoroughly mixed, to prevent an insoluble aniline getting on the surface, for if this should happen, different shades may be noticed in the finish as a result of wiping particles of aniline over the surface when wiping off. It is better to purchase oil stains already prepared to give the desired color and results, and thus avoid difficulty. Most of the oil stain is purchased already prepared, even by those factories using large amounts.

Oil aniline can be made to dry slow or fast depending on the amount of slow-drying solvents used. When the surface begins to dry or show a dullness it is time to wipe off to prevent streaks. The slow drying of oil stains appeals to most finishers, and for that reason this stain is used in many places where water stain would be better. Little care is necessary in the application of oil stain except not to allow a slopping of surfaces where the stain is not wanted or to allow the stain to run. If sprayed on, any surfaces not needing the stain can be avoided by sloping the gun. In brushing care must be exercised at abutments or corners and the insides of drawers or cabinets.

When wiping oil stains it is best to wipe uniformly each piece and about the same time after staining to insure a uniform shade over all the work. When wiping the last strokes with the pad should be with or parallel to the figure of the wood. Wiping across the grain will leave streaks at times, especially if the stain is too dry. Very little instruction is necessary to get a uniform shade with oil stain, as wiping over twice will often tone up a surface that appears too light.

### APPLICATION OF SPIRIT STAINS

While spirit stains are of little use in the factory, except for shading, if quick drying is a factor, and sometimes it is, these stains can be used on any finish over which is applied a heavy coating of paste filler or oil varnish.

The drawback to these stains in the past has been the difficulty in brushing them on without streaks, for they dry faster than one can apply them on large surfaces. This has been overcome by using the spray gun, and a very even surface can be obtained in this way. With the proper adjustment of the nozzle and air pressure, very fine shading can be done over the filler and previous to the finish coats.

There is no way to slow up the drying time of this stain without diluting with water, and this is not satisfactory, as few of the spirit stains are soluble in both water and alcohol. Naphtha could be added to those spirit stains that are soluble in this solvent, but in every case of dilution the shade of the stain will change and sometimes ruin the formula. Brushing on a large scale is therefore out of the question. Dipping of the stains is impossible on account of runs drying at once when removed from the tank. Small surfaces that could be dipped would be better stained in a water or oil solution.

The only place where the brushing of spirit stain is important is in refinishing and information is given in Chapter IX on this point. Spirit stain must be brushed on fast and not touched again. Lay the brush on the surface and pass across quickly and proceed to cover the whole surface as fast as possible. Never cover a surface twice, but use a smaller brush to touch up skips. Do not wipe.

### DIPPING STAINS

Factories making chairs, smokers, and many small pieces can dip these in tanks containing either water or oil stain solutions. The time they are allowed in the solution should be noted and always wiped when removed.

# CHAPTER V

## FILLER

THE pores, or cells, of the wood fibre must be filled to give an even surface when finished, and as a smooth finish is desired on most furniture, it follows that we must use filler. There are two kinds of paste filler. One is new and is intended to be used under a lacquer finish. The oil paste filler, so common and used more than all other fillers, is a paste mixture of silex, or silica, ground with linseed oil, japan dryer, turpentine, and different colored pigments, such as the umbers and ochres.

The paste filler used under lacquer is just now in the stage of development. The tendency is toward an oil paste filler that will not be disturbed by the lacquer, but any filler that can be dissolved by toluol or xylol (two coal tar solvents used extensively in lacquers for cutting gums) will always give trouble and require longer time for drying. For this reason it is advisable before using to test out all fillers, to see if the lacquer will dry clear over them. To do this use a panel of the same wood to be used in the major job, and after staining by the accepted methods, and after twenty-four hours of drying under good conditions, use a sample of the filler of the right color. Apply the filler and when hard dry, a good coating of lacquer—two coats will give a better test. If the lacquer dries within two hours and the surface is not cloudy, it is reasonably safe to use the filler for the job at hand.

### FILLER AS STAIN

Wood fillers are commonly used for staining as well as filling the pores, and especially is this true in regard to walnut. The wood is dark and requires only a little stain to give the desired shade. Filler is employed also in two-tone finishes by using a transparent or natural filler, with just a little color for the light shade, the darker portion to be filled with a dark filler. Oil soluble aniline can be added to the filler to darken it, usually brown or black.

Fillers are to be had in the following shades: natural, golden oak, light mahogany, dark mahogany, walnut, ebony and white. With the addition of pigments ground in oil or japan, any desired shade of filler can be made. Factory-prepared fillers are always standard in color and consistency, and the use of these prepared fillers is recommended. It would be bad practice for one to prepare his own fillers from the raw materials. It would be poor reasoning to suppose that a novice, or even an experienced finisher, could economically prepare his own filler with the same degree of accuracy as the manufacturer. It is only necessary that the finisher have a knowledge of what makes up a good filler, and how it is to be tested and used.

### CRACK FILLER

There are times when a filler is needed for cracks and frequently it cannot be obtained readily. The following formula, to be used for a water mixture, made into a putty, can be put into cracks with a putty knife:

Mix thoroughly one pound of dextrine, one-fourth pound silex and one ounce of powdered glue. Keep this powder handy and when ready to use, add water stain to enough of the powder to fill the job. This filler will dry hard in a few hours and will serve well for small fillings. A good crack filler and also water putty can be purchased from most any supply house.

In the use of walnut, oak or mahogany fillers, about all the change that must be made is to add a little color in oil, usually burnt umber or vandyke brown, or for a considerably darker color, drop black or lampblack, to the filler to obtain the desired shade, mixing well before using. Oil aniline can be added also to tone up the filler.

The following oak finishes, when done the accepted way, do not require any filler, but are finished over the stain: Fumed oak, Flemish oak, Jacobean oak and weathered oak and mission oak.

### WHITE PORE FILLER

Silver, French or Kaiser gray oak finish can be made by staining with a light gray or brown oil or water stain and then filling with a white filler. A thin wash coat of white shellac, about one or two pounds of shellac gum to the gallon of alcohol, can be brushed over the stain. After the stain is thoroughly dry, fill with the white filler. The shellac prevents the moving of the oil stain (oil stain is commonly used on oak finishes) when the filler is brushed on.

### USE OF NATURAL FILLER

Natural oak finish requires a natural filler, the color of linseed oil, which is thinned and applied the same as any other filler. Many finishers prefer to buy the natural filler and mix their colors in oil with the filler, or if quick drying results are desired, colors ground in japan dryer can be used. This use and practice is the result of many different color combinations and a variety of finishes, so that it would not be economical to buy a different filler for each finish, as little of the filler would be required.

### TESTING FILLER FOR SHADE

In testing out filler for shade it is an excellent idea to stain a piece of wood similar to the one you are to fill, with the same stain, at the time you are staining the larger piece. When you are to test the filler for shade, which should be as near a match to the stain as possible, apply the filler to a small portion of this and in about an hour brush over a coat of shellac, overlapping the part now filled. Any material difference in the shade should be corrected by adding color or using a lighter filler. Trying to tone out the color in filler is a dangerous undertaking, as too much thinner will allow a quick precipitation of the silex and color, and a good filler job is not possible when filler is too thin.

Most prepared fillers are furnished with directions as to the amount of naphtha to be used to the pound of filler, but if no directions are supplied, one can thin to the consistency of a thick pea soup and just thin enough to brush on freely. Such surfaces as gum, birch, beech, maple and the evergreens do not need much filler, if any, and the filler should be made much thinner for these woods than for oak, mahogany or walnut. Most finishers shellac the first named woods after the stain coat and use no filler, as the pores are very small in these woods.

## AGITATING THE FILLER

When the filler is the right consistency and the proper color, its shade producing the same or darker shade than the stain, as desired, it is ready for application. The filler should be mixed in a large receptacle, if much filling is to be done, and only enough for the day's work at hand or sufficient to finish the job, if a small one. The filler must be stirred very often, every minute or two to prevent settling, as the thinner at the top will not fill properly, and when you reach the bottom, it will be too heavy and tough and will not wipe off well or level.

## APPLICATION OF FILLER

Use a stiff bristle brush, from two to four inches wide and with medium length bristles. The width of the brush, of course, depends on the size of the pieces you are to fill. After the filler is thoroughly stirred, flow on the filler liberally and brush out with the grain and across the grain in such a manner that the filler is forced into all the pores. Some advocate the brushing across the grain as the last operation, but this is not necessary if sufficient brushing is done to insure the sinking of the heavy particles into the pores. Finish with a light stroke with the grain. All surfaces can be coated to advantage if horizontal, as a heavy coat can be thus applied to such woods as oak and mahogany where much filler must be used in order to fill the wood properly. However, it is not necessary to do this unless you feel that one filling is all you expect to give the wood and you wish to be sure that this filling will fill thoroughly. Many cabinet pieces are filled well on the tops and drawers, because they are placed in a horizontal position when filled, when the sides and frames are poorly filled and noticeable. The filler acts better on a horizontal plane surface than on a perpendicular

**Plate XXIX.—Application of Filler. Surplus Quantity Applied to Show a Liberal Coverage.**

one. Laying all surfaces horizontal would, of course, upset schedule in a factory, and for various reasons is not regarded as practical.

### FILLING CARVINGS

Carvings sometimes are not filled because the filler tends to round the edges and fill the recesses too much, and it is difficult to wipe out such places. If the carvings are not filled, they must have at least one coat more of material than the rest of the finish and usually an extra coat of shellac.

### WIPING FILLER AND DRYING

The usual drying time for fillers is from fifteen to thirty minutes before wiping, but no rule for wiping can be given, because the drying time depends on the amount of oil or japan in the filler and the consistency after thinner has been added. The more linseed oil added, the slower drying, and the more japan added, the quicker the drying. When the filler is too thick in consistency it will dry rapidly, in fact, too quick for a clean wiping. When the filler has begun to get light in spots or dull in appearance, one should begin to wipe off, using sea moss, excelsior or wood wool or burlap. Any material may be used that will not lie flat on the surface, but has a tendency to cut off the excess filler even with the wood surface. It is best to wipe first across the grain with even pressure and then finish lightly with the grain, being careful to get the filler wiped clean. Allow from eighteen to twenty-four hours for drying.

### LIQUID WOOD FILLER

It is often necessary to fill oak twice and also mahogany at times, depending on the grade. Honduras mahogany is light and porous and must be filled twice. Usually the second coat is of a liquid paste variety, such as used on birch and gum.

Where a mill for grinding is at hand, the following mixture can be made for a liquid filler. A good mixer may do, but is not recommended:

To one gallon of good rubbing varnish add
1 quart of turpentine
1 pint japan dryer and mix with 2 or 3 pounds of fine silex.

The addition of a little corn dextrine will also help to make a good formula, but not over 25% in volume to the silica.

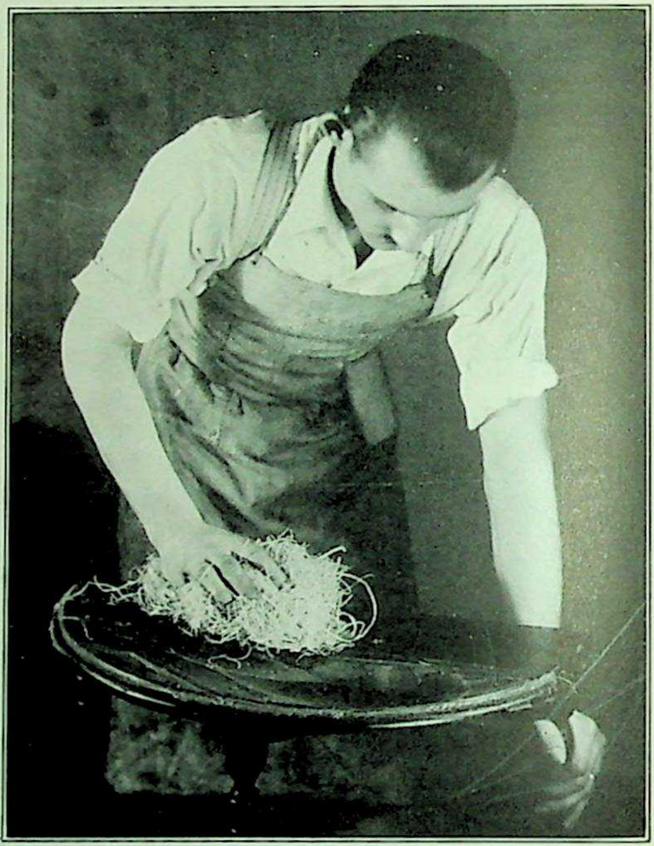


Plate XXX.—Wiping of Filler with Excelsior or Wood Wool.

Mix the liquids together and then add the powdered silica and dextrine, afterward adding color in japan and running the batch through the mill. Use just enough color to give the proper shade to the filler. This filler can be used on all close-grain woods and should be fairly thin when used.

## APPLYING LIQUID WOOD FILLER

Apply liquid wood filler in the same manner as described for the heavy paste fillers and when it begins to dry, wipe off thoroughly in the same manner. Many finishers have had bad results trying to make a filler of this kind without grinding, and as a result it has bleached out later and had white spots under the finish. This, of course, is due to the silex not being ground with the color and dextrine and not thoroughly mixed.

## ALTERNATING FILLER

In most cases where a liquid filler of reliability cannot be had, it is much better to give a coating of shellac varnish, as described in the next chapter. This coating will dry quickly and prevent suction of the finishing coats, or if finishing with lacquer, a spray coat of lacquer, with the addition of twenty per cent shellac, will suffice to prevent suction or sinking of the finishing coats.

# CHAPTER VI

## CHOICE OF FIRST COATERS

THE different materials that can be used and are used for a first coating on wood surfaces, and especially for modern furniture, are numerous. They fall into two general classes, namely, for the transparent finishes and the opaque finishes. For the transparent finishes, in the order of their usefulness, are the following: Shellac varnish (white and orange), seal coat (first coat varnishes) of different formulæ but containing oil and japan, but with varying amounts of different gums, and many different lacquers (wood oil and pyroxlyn cotton).

### OPAQUE COATERS

Opaque first coaters are not so numerous, but cover a wide range of paint materials. It is generally accepted that varnish materials are transparent, but paint materials are opaque, and for convenience we will regard them so. Flat white from lead, lithophone, zinc, etc., is used extensively and colored with pigments in oil or japan. The best flat whites do not contain lead, as they turn yellow with age. They are usually termed enamel undercoating or paint primer.

Of course the first coater may be purchased in any color. Factories usually select a standard shade and have the paint factory duplicate it. In this way a special formula can be made for each factory, thus insuring it a shade or color that will be exclusive. Colored lacquers play an important part in the finishing department of a large factory and these consist of pigments ground in lacquer.

### SHELLAC FIRST COAT

If a piece of furniture is to be finished in a shellac finish and waxed, it is plain that you should not use anything but a shellac varnish as a first coater. White shellac should be used on natural finishes of any light wood, from mahogany down to the clear maple. Orange shellac can be used on all dark finishes. This coater must be used over oil or water stain. Do not use it over spirit stain, as the stain will be absorbed into the shellac coat and smeared around, making a cloudy, streaked finish. This coating can be used over any paste filler, when thoroughly dry.

### OIL VARNISH FIRST COAT

All the first coat oil varnishes, or seal coats, are applied the same as rubbing varnish, and the principal materials used in them are the same, namely, linseed or other oils, dryer and gums. On natural finishes a varnish with damar gum will be more transparent. Most oil varnishes give an amber cast to the finish. An oil varnish coater or sealer cannot be used with success over an oil stain without filler as the varnish will dissolve the stain and cause the varnish to dry very slowly and give a cloudy finish. This varnish may be used over water or spirit stain, but it is mostly used over water stain because it will dry better over this stain. This varnish has no evaporative qualities, but must oxidize, and any stain that will mix with it will prevent drying. If the paste filler has dried very hard, at least twenty-four hours, it may be safe to use this varnish, but it is best to use a wash coat of shellac over oil stain or filler before using oil varnish.

### RULE FOR VARNISH FINISH

If you desire a varnish finish it, of course, follows that the first coat should be a seal coat varnish, or in case of being over oil stain or filler, a wash coat of shellac. If too heavy a coat of shellac is used for a first coater, all the pores of the wood will be filled and the varnish will not knit with the shellac. This condition results in chipping of varnish off the shellac coat, which is very noticeable. So be careful about your shellac coat, if an oil varnish is to be used over it. Make it thin, just enough to cover the stain and filler. The best rule is to use water stain, paste filler and a wash coat of shellac, and then a first coat of varnish. This procedure suffices for all varnish surfaces.

### RULE FOR TRANSPARENT LACQUER FINISH

In event you wish a lacquer finish of a satin lustre, or dull for an ending, use water stain only. Fill with a special filler for lacquer and then coat with clear lacquer or with a mixture of shellac or shellac varnish of about twenty per cent (white) for first coat. Oil or spirit stain will be absorbed by the ingredients of the lacquer and poor drying will result. Furthermore a cloudy or streaked finish will result. The procedure is the same for gloss or polished clear lacquer finish. If the filler is the right kind, the finish will really be better with lacquer directly over the filler.

### RULE FOR OPAQUE LACQUER OR ENAMEL FINISH

For all enameled surfaces a flat color must be the first coat, and if a piece is refinished and to be enameled, be sure there is no aniline that will bleed through the undercoat. This can be tested by spraying some of the material over an obscure portion a day ahead of the starting of the coating; this will reveal any bleeding and prevent a useless coating, for if it bleeds, you may be obliged to do all the work over again. When new wood is used all the precaution necessary is to select some wood with a very close grain, as maple, gum or birch. A regular lacquer enamel can be used as a firstcoater under the same material for second coat.

### SPRAY AND BRUSH METHODS OF APPLICATION

So much can be said about the use of the spray gun equipment that it is deemed advisable to treat this fully in a separate chapter. A reference to index will give you complete information regarding its use and care.

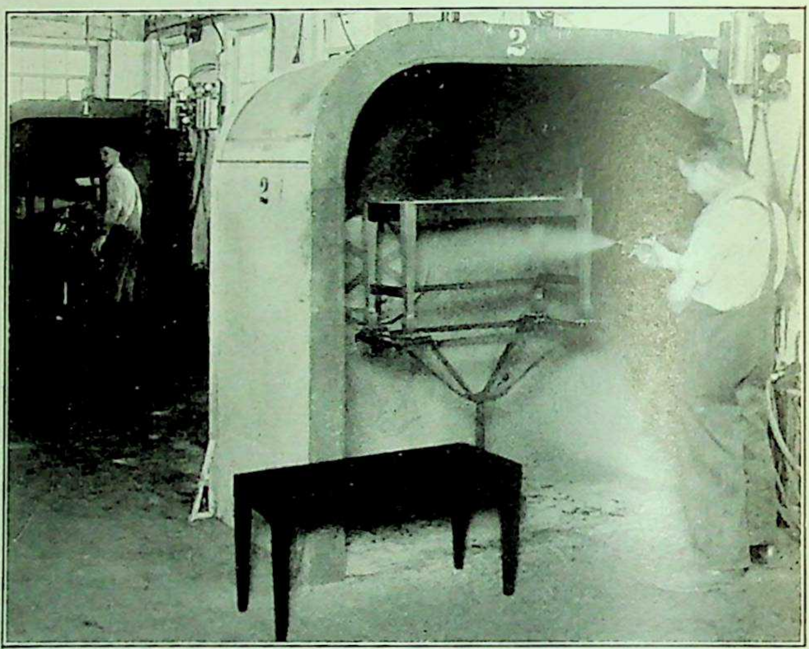
All first coaters can be used with an air gun and many of them work easier and form a much smoother coat used in this manner. Shellac and lacquer are two of the first coaters that should never be applied with a brush if a spray gun can be used. The reason is obvious—the fast drying of the film does not allow brushing over or lapping of the brush strokes.

### SPRAYING SHELLAC OR SUBSTITUTES

In spraying shellac, or substitute shellac and other spirit varnishes, the products should be reduced with C. D. No. 1 alcohol to a right spraying consistency with low pressure, and the nozzle turned down far enough to prevent flooding the surface. Four pounds of shellac gum to the gallon of alcohol is the usual shellac formula, and with this for an example, you should reduce from twenty-five to forty per cent. The air gun should not be held too close to the work or the surface will be flooded. The distance will depend on the pressure and the consistency of the material. The nozzle of the gun may be held anywhere from six to twenty-four inches from the work, depending on the work to be done and whether the material is fast drying or not.

When you have reduced your shellac to the right consistency for spraying and have tried it for results on a separate surface, start spraying your surface. On flat surfaces begin next to you and spray with the grain from the left to right, past the edge, and back from right to left, dropping back each time just far enough to overlap one-third of the last strip. This overlapping must be done to produce a full coverage, as the edge of the spray feathers out and has little covering quality near the edge. The reason for passing over the edge each time is to prevent flooding the surface at this point when stopping to come back again. On perpendicular surfaces it will be best to start at the top and work down, slanting the brush down so that the sprayed surface will not be splattered by the overspray of the gun.

All removable parts of cabinets or other pieces should be removed and sprayed separately. In case of panels in any piece it is best to spray the panel first, being careful to cover the edges near the frame, and then spray the frame by slanting the gun away from the center and passing the spray all around the edge with the spray blowing away from the covered portion.

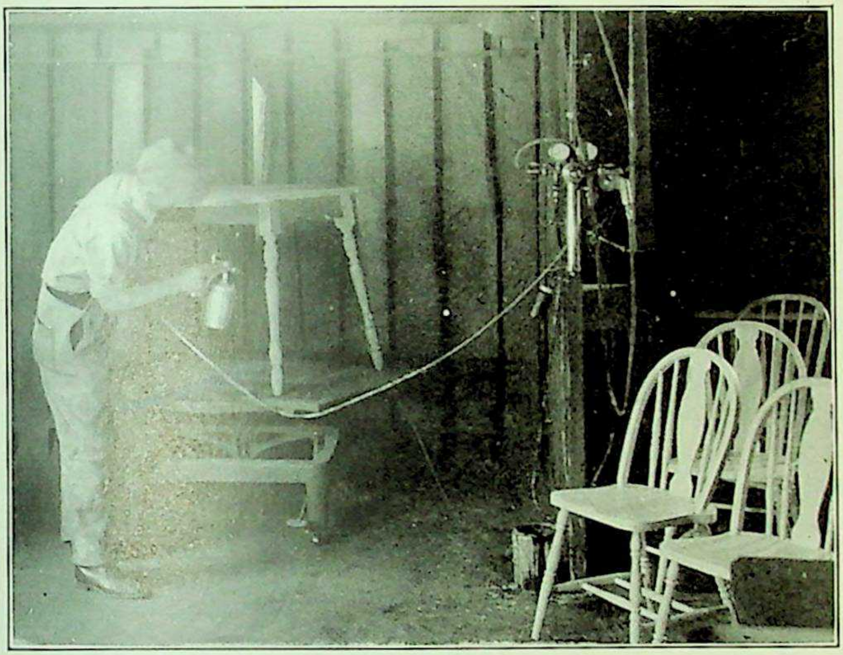


COURTESY PEERLESS PNEUMATIC SYSTEMS, INC.

**Plate XXXI.—Spraying First Coaters—Shellac or Lacquer—Also Second Coat —Lacquer or Varnish.**

A coat of shellac is applied to the unstained surface or unfilled surface; this may be necessary also where other kinds of decorations or finishes are to be applied, to prevent the coating of that particular surface.

Care should be exercised when coating flutes, grilles, mouldings, or composition ornaments, as they will most likely flood and fill too quickly. These rough and raised surfaces will be well filled when the other coats have been applied, so little material is required for each coat on these ornaments.



COURTESY OF THE ALEXANDER MILBURN CO.

**Plate XXXII.—Spraying Enamel Undercoating or Lacquer Enamel. Note Material Is in Cup Attached to Gun.**

## BRUSHING SHELLAC OR SPIRIT VARNISH

The brushing of any spirit varnish requires plenty of practice to get good results. It is inadvisable for an inexperienced man to try to finish a piece of furniture in shellac or any spirit varnish with a brush. He could not expect to get a smooth finish, on account of runs and sags, or a rough surface from brushing out after setting.

If the shellac is what is known as "four-pound cut" (four pounds of shellac gum to the gallon of alcohol), reduce one gallon by the addition of a quart of C. D. No. 1 alcohol. This will give about the right consistency for brushing. Remember that shellac dries as soon as the alcohol evaporates.

### SHELLAC TURNING WHITE

One way to prove why shellac turns white is to add some water to a shellac varnish and apply it. The film will be cloudy to white, depending on the amount of water in it. If you happen to be in some section where the use of shellac is taboo, as the result of so much rainfall, it is best to eliminate this product entirely and use some of the other undercoaters.

### THE SHELLAC BRUSH

When applying shellac, or any spirit varnish, with a brush, be sure that you have a brush of the right size and bristles set in rubber. The average cabinet finishing requires either a two- or three-inch brush with medium length bristles. Some finishers prefer a soft fitch hair brush and others a Chinese bristle. A brush that will allow a quick flow of the varnish to the surface is best suited for fast drying products.

### APPLICATION BY BRUSH

When brushing flat surfaces horizontally, begin at the side farthest away and work toward you, being careful to pass over the edge each stroke. Always stroke with the grain so that any brush marks will not be so visible. Notice in the illustration the correct position when coating with a brush. When starting coat the top parts of the piece and move down, taking everything as you go, so that you will never be obliged to come back to pick up a spot missed, and in that way drop material over a coated surface. If you should drop material on a coated surface, merely pass the brush over quickly to smooth out as soon after dropping as possible. The brush should be free from flowing material when picking up places or brushing out spots. Shellac cannot be brushed over at all after setting, so one must be careful to cover every spot as he goes along and avoid laps by going over it again.

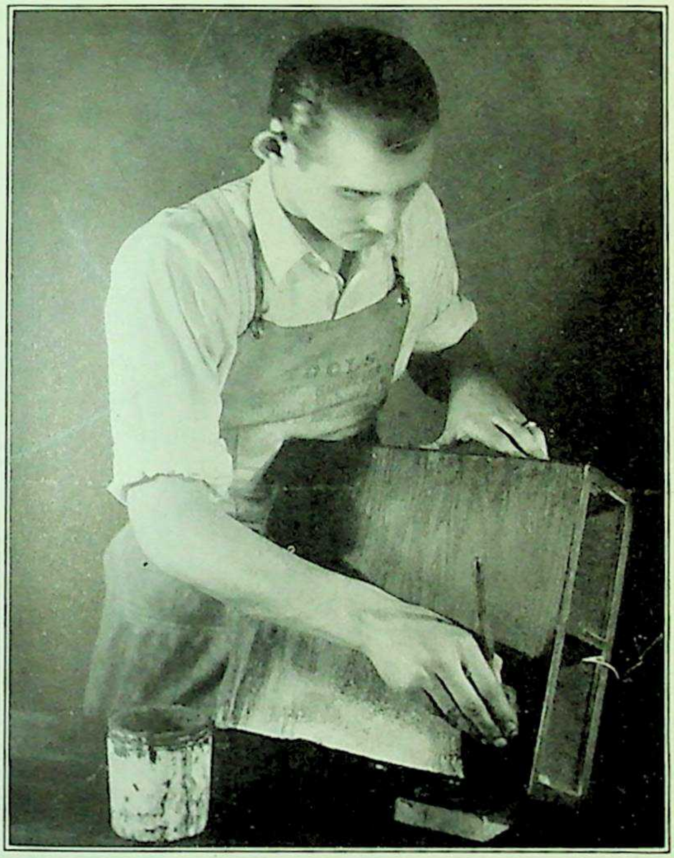


Plate XXXIII.—Showing Correct Position in Brushing any Material. Upward Stroke, Beginning at the Edge. Note where Brush Is Gripped.

## FACTORY PROCEDURE

Panels must be covered first and then the frame. The outside of drawers and all movable parts must be coated separately from the frame and not replaced until finished. The procedure in factories is to run the frames through and the removable pieces on a truck beside the frames; in this way every piece gets the same treatment by the same hands and, of course, will be uniform.

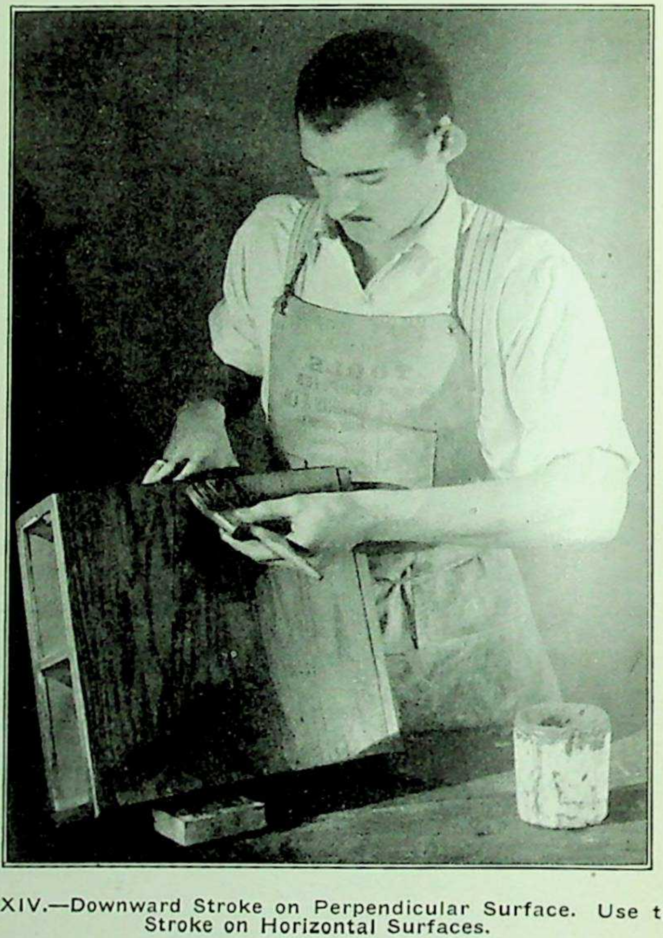


Plate XXXIV.—Downward Stroke on Perpendicular Surface. Use the Same Stroke on Horizontal Surfaces.

### HOW TO LEARN BRUSHING

Practice with a brush with shellac thinned twenty-five per cent with alcohol, and keep up a constant stroke, back and forth, past the edge of a flat surface, until you can put on a coat on a space the size of a dresser top or davenport table. In this way you can become proficient in applying spirit varnishes to large surfaces. In covering round surfaces, go completely around, advancing up or down. In cases of flutes on turned legs it is necessary to coat the fluted portion first, using an up or down stroke. Carvings can be brushed in with plenty of varnish in the brush and then picked out with the brush empty of material.

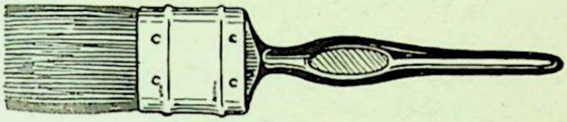


Plate XXXV.—Shellac Brush.

In brushing quick-drying material near frames of panels or other abutments, the brush must be set down against the abutment and pulled away quickly toward the center; then set the brush against the opposite ledge and pull quickly to the center, lapping at the center before either has a chance to set. This, and many other operations when brushing shellac, require speed and accuracy and can be obtained only by practice and great care.

### SPRAYING OPAQUE FIRST COATERS

Paint, enamel undercoater, and lacquer enamel undercoater and all the other opaque materials used as a first coat, can be sprayed with most air guns. The nozzle, of course, should be made to properly atomize these materials and a higher pressure can be used on the heavier bodied materials. Explanation for use of spray and its care can be found in a separate chapter.

The same care must be exercised with the spraying of pigment coaters as with the spirit varnishes and the spray should be slanted away from the coated work always to prevent the overspray covering the coated part and spattering it. Work on horizontal surfaces from the closest edge, away from you and past the edge with each layer, and so overlap the coat each time in such a way as to secure a full coverage.

Hold the gun far enough away to prevent a pebble finish, and close enough to prevent a waste of material in the air, and a dusty surface as result of material drying before it reaches the surface. The pressure must be regulated for each individual material in order to get these results.

Some authorities advise crossing the work with opaque coaters in order to secure full coverage, and this should be done on the succeeding coats if only two coats are to be applied with spray. In case two coats are to be applied, it would seem advisable to cross the grain for the first coating.

### BRUSHING ENAMEL UNDERCOATERS

A soft bristle brush, not over three inches wide and often smaller, must be used for enamel. Short bristle brushes of fitch and chisel type are ideal for a flat enamel undercoater. Of course no filler is used under this coat where the close-grained woods are used, such as gum, birch or maple. Some of the soft woods, as pine or spruce, are also used for enameling or lacquering.

The undercoaters for enamel are usually of the right consistency for brushing and do not need thinning as they do for spraying or dipping. However, if they do not brush out easily, they can be thinned with spirits of turpentine, but be careful not to add too much or the covering quality will be impaired.

Smooth, even brushing is required for undercoat enamel to insure a good smooth surface for succeeding coats. Look out for runs with this material as it does not dry fast and will run several minutes after it is applied. One good thing about brushing oil enamels or undercoaters is the ability to pick up runs and sags after coating, as the slow drying qualities permit long working. More care must be exercised not to coat any surface on the inside of the drawers or frame of cabinets or any other surface not supposed to be coated.

### LACQUER UNDERCOATING

When the new pigment lacquers came on the market a few years ago no one thought of brushing them. Now several concerns are making flat and gloss pigment lacquers and colored lacquers (these are colored with aniline oil stains), all for brush purposes. The results so far have not been particularly encouraging, but there is no doubt that a good flowing product that can be used by anyone will be developed soon. The products now on the market will permit of good work on small surfaces, and the average person will soon be able to brush on a pigment lacquer or colored lacquer on any surface and yet have a product that will dry in two hours.

When brushing a pigment or colored lacquer, work just as fast as with shellac, unless a slower drying product is produced. A good soft bristle brush, set in rubber, is the best to use, and the thinner, for the lacquer, can be used to keep the brush in, or clean it when not in use. Little thinning is necessary for brushing lacquer. For spraying a transparent lacquer containing a fine pigment for filling is obtainable. Lacquer enamel does not cover or fill sufficiently.

### DRYING TIME FOR FIRST COATERS

Shellac, spirit varnishes, lacquers (nitro-cellulose) and lacquer enamels require from two to four hours for drying after the first coat is applied, and for best results, should never be recoated in less than five hours. Weather conditions have little to do with the drying of these products, but of course damp days will frequently cause a gray film to form on shellac or lacquer, and in some sections prohibit their use.

The stain or filler under these coats will determine, to some extent, the drying time of the above products. If water stain has been used, little difference can be detected between a surface on this stain and one over a bare wood surface as regards drying, and for this reason water stain is to be highly recommended under these products.

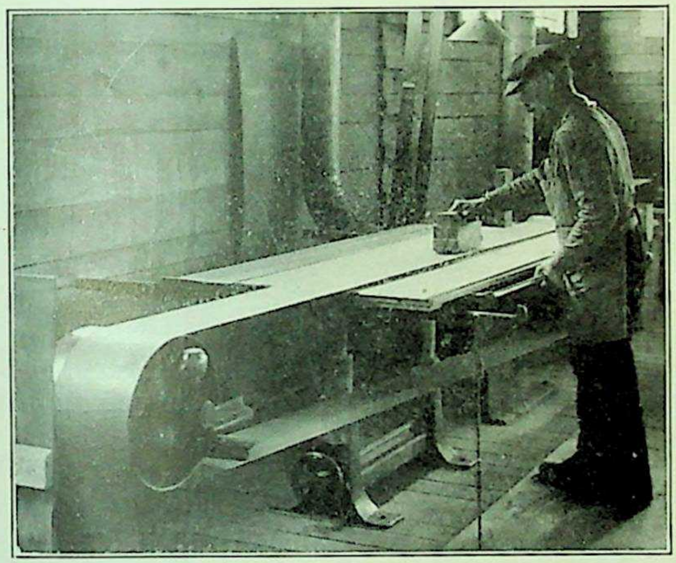
Undercoaters of pigments and oil, other paint materials or oil varnishes require from twelve to twenty-four hours, depending on the kind of material and the conditions under which it is placed when drying. Some of these materials may contain considerable japan dryer and for that reason dry much quicker. There are many japan pigments which will dry thoroughly within two to four hours, but they are rarely used except for striping and other decoration. They are used to some extent, however, under lacquer and varnish, and for speed. Overnight drying would be safe for most japan colors, but twenty-four hours would be the average for flat enamel undercoaters or varnishes made with oil for a binder.

It should be mentioned that most of the materials under this heading dry by oxidation and require a great deal of heat to dry within the time specified. A good enamel undercoat or varnish will dry in twenty-four hours in an even temperature of from 75 to 85 degrees Fahrenheit. If the temperature of the room falls below 70, you may expect the varnish to be tacky in this time. A good test for surfacing a coat is to press down hard with the palm of the hand for twenty seconds, and if no tacky or printed surface is noticed, you may proceed to surface.

## SURFACING FIRST COATS

Several kinds of machines for surfacing are on the market. Some have attachments for using garnet finishing paper, steel wool, and felt pads. With such a machine large or small surfaces can be rubbed with ease. A pneumatic or electrically propelled rubbing machine that can be moved about on the surface with the hands can do as much work with one man as two or three men can do by hand methods. These machines usually have two feet on which may be attached steel wool pads or garnet paper and they oscillate as the machine is moved back and forth either across or with the grain.

If a machine is used on flat surfaces, care must be exercised as to the pressure applied, as many of them do sufficient work with their own weight. The directions should be followed carefully when using a new machine or when a new operator is using the machine. Most surfaces can be surfaced with the grain of the wood, especially the first coat, though some recommend first crossing the grain and ending up with the grain lightly.



COURTESY OF UNDERWOOD VENEER CO.

**Plate XXXVI.—Belt Sanders Can Be Used on Flat or Moulded Surfaces.**

## BELT SANDING

Many surfaces cannot be sanded with a machine and much work is done by hand in the factories and especially in smaller shops. Hand surfacing must be employed on uneven surfaces, except where it is possible to use a belt sander. The belt sander can be used on many surfaces that cannot be reached with an oscillating rubbing machine and included in these are the mouldings. The opposite cut from the moulding used, or the reverse of this cut, can be pressed against the belt and the sanding performed in this manner. Of course much care must be used on a first coat of material. Usually removable parts of cabinets are sanded in this way.

Another method is employed on turned pieces, and that is using the wheel sander. The wheel is turning at many revolutions a minute and the piece is placed in contact with the surface of the wheel, to which is attached garnet finishing paper of the proper grade. The surface in this way is smoothed quickly, but very liable to cut through with this method, as the pressure is hard to keep even. For that reason little of this kind of sanding is seen in sanding rooms.

The lathe furnishes not only a method of turning out wood, but of sanding as the piece turns in the lathe. The paper can be made to fit the piece and as it turns the paper is applied and thus the piece is surfaced very quickly. The lathe furnishes a quick means of finishing turned surfaces, as noted in *Special Finishes,* Book V. Belt sanders and sanding machines are seldom used on furniture after any coats of finishing material are applied. Even in factories most first coats are hand-sanded, as there is not enough material on the work to permit of machine sanding.

### HAND-SANDING FIRST COATS

The materials for surfacing are described in Chapter III of this section, and reference should be made to this chapter if any of the materials are unfamiliar to the reader. Suppose you are ready to surface either a lacquer or shellac surface as a first coat; it could be done with steel wool grade 0 or 2/0, but inasmuch as the object is to smooth as near level as possible, it is best, in most cases, to use dry garnet finishing paper. The reason for specifying dry paper is to make a clear distinction between this paper and waterproof garnet paper. The grade of paper varies from 4/0 to 6/0, depending on the roughness of the surface. The smoother the finish when dry the finer the paper to be used and 5/0 can always be used for sanding a first coater. It is obvious that waterproof paper is to be used with water and, of course, it is dangerous to sand a thin coat with water.

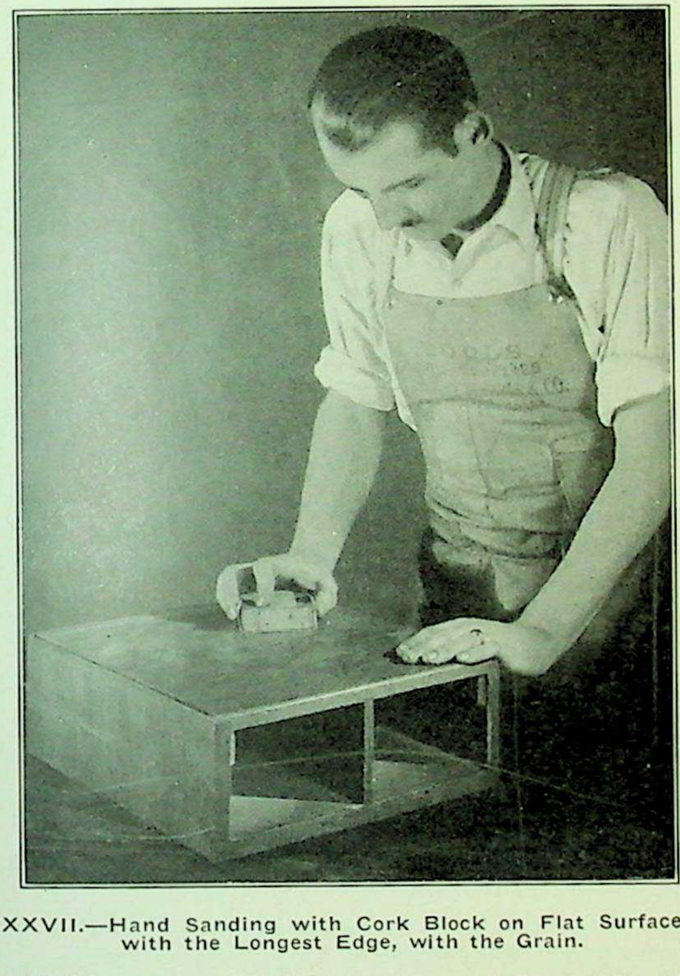


**Plate XXXVII.—Hand Sanding with Cork Block on Flat Surface—Parallel with the Longest Edge, with the Grain.**

Sand all first coaters with the grain and do not lap the sanding more than necessary. A lap means more sanding on the lapped surface and little sanding is necessary for first coaters.

Sanding through this thin coat is very easily done. Edges are to be shunned. It is evident that an edge has little coating, and for the first or second surfacing, can be eliminated or touched lightly. Abutments can be sanded across the grain first as well as the ends of flat surfaces and then finished with the grain to make a uniform surface. Carvings are not usually touched until succeeding coats.

### HOW TO HOLD FINISHING PAPER

Hold the piece of paper in the hand, or wrapped around a sanding block of felt or cork, and work from the farthest side, toward yourself, going all the way across the surface, with the grain, allowing each stroke to overlap the other far enough to make a full covering, leaving no part of the surface untouched. The paper should be held between the third and little finger and lay the hand flat on the surface. If the paper cannot be held firmly between the fingers, the palm of the hand should be made damp, and then the paper will adhere to the hand and not slip.

If the paper clogs up it is a sign that you are sanding a green surface, or else you are putting too much pressure on the paper, and the heat from the friction thus caused will melt the finish and clog the paper. When the paper refuses to cut, or has become too clogged with material, it is time to select another eighth-sheet and start anew. Do not wet the paper, as the glue size will dissolve and the grit will move off the paper.

The same method can be used for surfacing any enamel undercoat, lacquer enamel or japan coating. Steel wool may be used to advantage on all these surfaces where it is hard to operate with a stiff finishing paper. This applies to turned surfaces, flutes, grilles and carvings. Rub lightly and carefully with steel wool and have a pad with an even surface. This product cuts through edges just as quickly as the paper, so keep away.

# CHAPTER VII

## SECOND COAT — MATERIALS — SELECTION

IT IS difficult to lay a hard and fast rule for the selection of second coat materials. So many different combinations can be made by using a coat much different from the first one, and of course the same material can always be used. By naming the most important combination, we can get some idea of the number of different combinations that can be made with this coat. Use the shellac varnish, for example. The same shellac can be used for a second coat, and it is often done by manufacturers who believe that this will produce a finish which will give them the least trouble. One of the largest furniture factories in Grand Rapids, Michigan, finishes much of their cabinet furniture with shellac, and claim that this is the best finish. They are in the minority in this belief, but it seems to suit them. Of course shellac has a low melting point, and is not waterproof, and it would seem to be inferior to the new lacquer finish in these two points, if not in others.

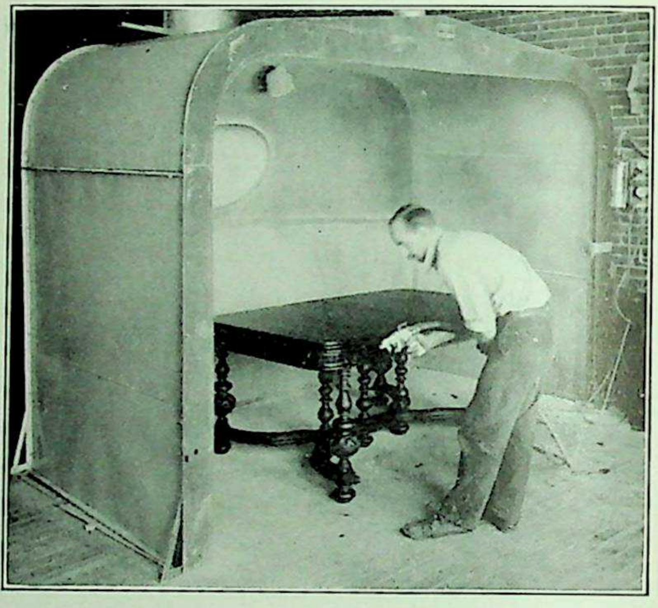
### VARNISH OR LACQUER OVER SHELLAC

Lacquer can be applied over shellac with a perfect knitting coat as the lacquer will dissolve the shellac to a certain extent before drying. Oil varnish or the cabinet rubbing varnishes can be used over shellac, and this combination was the principal one until the last few years. Even now factories and shops in many places retain this method of flowing a rubbing varnish over a first coat of shellac.

The shellac seems to give a good coating under a second coat of lacquer for the reason that the shellac does not soften quite as quickly as a first coat of pure lacquer, and makes a better filler for the wood, allowing a better and heavier film of the second coat. Any spirit varnishes or lacquers, as well as any oil varnishes or enamels, can be used over a coating of shellac with good results. Varnish does not knit well over shellac, so it should not be applied over a heavy shellac coating.

### OIL VARNISH OVER OIL VARNISH

No coat other than oil varnish can be successfully used over a first coat of oil varnish. Of course paint or oil enamel can be used over a varnish coat, but this would be unnecessary, as a pigment undercoater would be the logical first coat for enamel. Shellac should not be used over oil varnish at any time.



COURTESY PEERLESS PNEUMATIC SYSTEMS, INC.
**Plate XXXVIII.—Spraying Lacquer. Complete Equipment, with Material in Tank.**

### LACQUER OVER LACQUER

It would not be proper to use any other material over lacquer, but finish up with lacquer instead on all coats. Of course if brushed, a pulling up of the first coat may result to some extent, and much care must be used in its application in this way, but if sprayed, you may be sure of a good application provided your air gun is in good working order and the pressure is correct.

### ENAMEL SECOND COAT

This material must be used over a good covering of undercoater to get good results. Two coats of a good undercoater and two coats of oil enamel will give an excellent job over close-grain woods. This should be used over birch, beech, gum or pine. Of course the enamel will not be the second coat if two coats of undercoater are used.

### LACQUER ENAMEL COAT

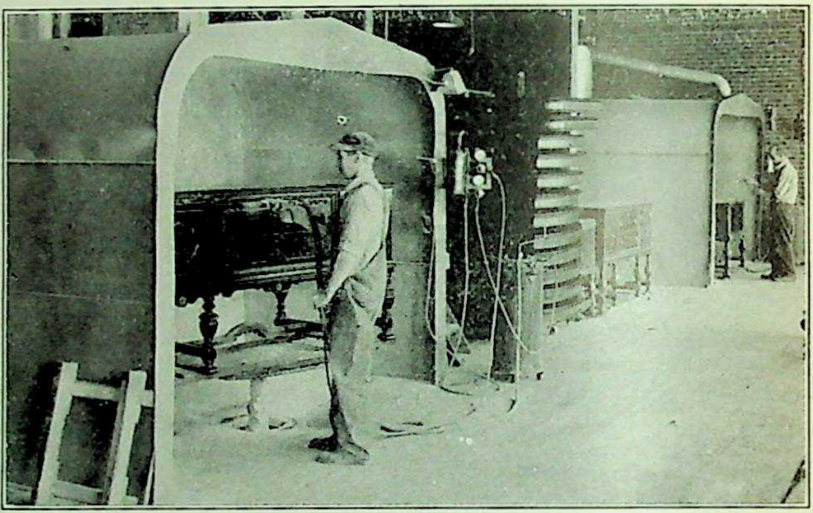
There are a number of lacquers ground in pigment and some made from japan colors mixed with the lacquer, and these are known under different trade names which is quite confusing. Of course there is no law like the ruling of the Federal Trade Commission on shellac, saying that only such a material can be called "lacquer." Everything that has a nitro-cellulose ingredient is named as a lacquer and, of course, of many different formulæ. It would seem that some difference should be noted between a clear, transparent product and the opaque product. The transparent one could be called clear lacquer, but a new name should be used for the opaque one, as lacquer enamel. In the meantime we will call all the opaque lacquers, pigment lacquers. We have also lacquer stain.

A pigment lacquer should not be used over any other coating than itself or pigment lacquer firstcoater, and in this rule you will find satisfaction.

### SPRAY APPLICATION OF SECOND COAT MATERIALS

Much care should be exercised in preparing the materials according to the directions on the packages before attempting to use them. The spray should be clean and adjusted to the right spray for the application of the material and this tested on a separate piece before proceeding.

*Spraying Shellac.*—Either orange or white shellac should be about three-pound cut (three pounds of dry shellac to the gallon of alcohol), and if this cut is not at hand, reduce to the desired consistency. Add one quart of alcohol to one gallon of four-pound cut shellac for spraying. Of course you may desire to cut it much further, but good results can be had at this consistency.



COURTESY PEERLESS PNEUMATIC SYSTEMS, INC.

**Plate XXXIX.—Showing How Dining Room Sets Are Put Through Finishing Room Together to Insure Uniform Results.**

The pressure of air must be thirty to forty pounds for this material. The adjustment on the nozzle should be cut down so that there is a lighter flow of material to the work to prevent flooding. Do not hold the nozzle too close to the work, as this also will cause flooding. A good gloss coat when spraying should be the aim for a good coverage, but not enough to cause runs or sags. This material sets quickly so there is little danger of any runs in the material unless the work has been flooded with material. Spray across the grain if the first coat has been sprayed with the grain, or vice versa. This will insure a better coverage.

*Spraying Nitro-cellulose Lacquers.*—Unlike brushing, the spraying method does not leave the long streaky brush marks, and it makes little difference whether you spray with or across the grain. A piece sprayed across the grain for the first coat and with the grain for the second coat will usually show a better covered surface, as there is less chance of missing a spot by failure to lap the spray coat sufficiently. By crossing each coat a failure to lap on one coat will generally be covered sufficiently by the second coat across the first.

The pressure for nitro-cellulose lacquers should be just above or below forty-five pounds. At this pressure the nozzle should be adjusted so that a fine spray at twelve to fourteen inches away will give a six-inch coverage without pitting or dusting. If a fine dust flows over the work beyond the indicated covering coat, it is an indication of too much air for the size of spray or weight of materials. No rule can be given for the exact air pressure or adjustment of nozzle, but good work must be done at an approximate distance of one foot from the surface to be coated.

If a white appearance is seen in the coat, you must look for oil or water in the air line. The work will never be satisfactory if oil or water get into the lacquer, as both are antagonistic to lacquer and ruin the coat. A simple separator for oil or water is described in Chapter III.

Always start at the edge nearest the operator, when spraying tops of cabinets or tables, and work away so as to prevent the overspraying of work finished. Do not zigzag, but follow a straight line across the work past the edge each time, holding the gun at right angles to the surface. Move along just fast enough to get a gloss coverage.

*Spraying Lacquer Enamel.*—This material sets up about the same as the clear lacquer, the difference being in the consistency. Some method must be found to agitate this material as the pigment will precipitate quickly. Of course if it is sprayed from a cup attached to the gun, no agitation will be necessary except when it is transferred from the container to the cup. If only two coats are contemplated, it will be necessary to spray each coat at right angles to the other and only thin the material enough to get it to spray. A low pressure should be used for this material as it dries quickly, and a heavy pressure will cause pitting of the surface.

*Overlapping Spray Coat.*—An overlap of from one-third to one-half of the width of the spray coat each time will be necessary to get a full coverage if only two coats are to be used for a complete finishing job. At least one inch on each side of a spray coat is blended out with a very thin coating, even where it seems to cover, so an overlap of two inches or more should be made on all lacquer spraying.

*Spraying Oil Varnishes (Cabinet Rubbing Varnish).*—A special consistency for spraying is made by the different manufacturers and this is recommended, rather than thin any varnish with turpentine or japan drier. Varnish is sometimes heated for spraying and, of course, it will flow much better if this is done. This material can be heated by steam or hot water as the safest method. Putting any material over a flame is a bad habit to get into—you may forget it and endanger yourself as well as others, and this is not allowed in most places as it is strictly against Underwriters' rules. When spraying a rubbing varnish or any kind of oil varnish, read the directions or follow manufacturer's recommendations.

Varnish can be sprayed as deliberately as desired, as it flows out easily and is slow drying. This material is not sprayed as much as the faster drying materials, for the reason that a heavier coating can be applied with a brush and runs can be picked up with the brush. If varnish is sprayed, a very light coat must be used each time, for the reason that it will run if sprayed on very heavy. Nearly all production shops using varnish apply it by spraying.

*Spraying Enamel and Undercoaters.*—Any pigment material that is heavy requires a different type nozzle that is supplied for use with this kind of material. Manufacturers make these materials especially for spraying, and when purchasing, be sure that the material can be used for spraying or that you are supplied with the proper thinner for reducing it to the right consistency. The air pressure and material feed must be adjusted to prevent pebbling of the surface. The pressure must be higher for this material, as it is heavy and slow drying. The opening in the nozzle, of course, should be larger than for thin liquids.

The application of enamel or undercoaters with a spray is not essentially different than any other material, except you must remember this is a slow-drying material and the surface must be evenly covered but not flooded in any spot. A heavy coat or a hesitation with the spray will cause a run on any surface except horizontal, therefore great care must be exercised on perpendicular surfaces not to flood, and move the gun along at a constant pace without stopping anywhere on the surface. Always move past the edge, never stopping on the edge when dropping down for a new layer of covering material. It is well to spray these coats at right angles, especially on opaque surfaces.

### BRUSHING SECOND COATS

To apply spirit varnishes, such as shellac or substitutes, or lacquers, in fact, any quick-drying material over a first coat of similar material, the material should be just a little thinner than material for the first coat and applied much quicker. Brushes for these materials must be medium soft bristles, similar to fitch, set in rubber, and be reasonably thick to hold a considerable amount of material, so that a full stroke can be made across any surface with one dipping of the brush.

*Brushing Second Coat of Shellac.*—The first coat must be sanded as smooth as possible, dusted off and cleaned up with a tack rag. Dilute the shellac to about a three-pound cut. Use a brush as described above, from two to four inches wide, depending on the size of piece on which you are working, and proceed to lay on the coat, beginning at the farthest edge and going across with the sweeping of one stroke, and do not brush out unless you have failed to cover or else left a surplus of material at some spot. Remember that the second coat will dry quicker, or have an appearance of so doing, as a result of penetrating the first coat to some extent.

On wide surfaces speed is the motto. Be sure to have your second brush stroke on the surface before the first is set, otherwise the second will make an overlapped surface by covering the edge of the first brush full and not blend as it should. There is no natural blending of one brush coat over another, and for that reason both strokes should be made as quickly as possible, besides a little brushing out to blend them to some extent. Be careful to go over the edges of tops after covering the surface and pick up surplus material deposited there by the brush when you rested the brush on the edge preparatory to beginning your stroke.

The frames of cabinets and all carcass work, except turned surfaces, are not difficult to coat with shellac or other spirit varnishes except where large flat surfaces, like table tops, are to be covered. There is only one system that will allow good work with shellac on large surfaces, and that is constant practice with much care and speed worked up to the point of being able to lay on a coating at top speed and at the same time not skipping any places or splashing material on a surface that has been coated. All removable portions should be removed and coated after removing. No one can do good work unless this is done. All drawers should be coated carefully on the edges so as not to overlap the finish on the inside of the drawer, as it cannot be wiped off like varnish if coated over another material.

In setting down a brush containing shellac, be sure that it has plenty of material in it and start the brush in motion as soon as you can, drawing it two-thirds across the piece to be coated and then go back from the opposite end, overlapping the first stroke. This applies principally on narrow surfaces where there is an offset or ledge to work from or panels.

*Lacquer Material Brushing.*—Be sure to read the directions above on shellac coating and then read these special directions for the application of lacquer materials. There is little difference in the application of transparent lacquer materials or opaque pigment lacquers; they are both difficult of brush application as a second coat over the same material. The clear lacquer is less difficult over a shellac coating as it does not pull up the finish as much or sink into the pores as much as over a lacquer first coat. The colored pigment lacquer materials are usually brushed over a coating of the same material and there is little alternative as to what material to use, as they are about all of the same basic materials. Some are more easily brushed than others. It is simply a question of thinning out the material to permit a quick flowing liquid and putting it on as quickly as possible. The next quality to be developed is some material that will not brush up when the second coat is flowed over it and brushed out. It seems the only thing to do at the present is to develop a technique for distributing lacquer over a coated surface with the brush as quickly as possible and as smoothly as possible. It can be done and, of course, anyone can do it with enough practice.

*Varnish or Enamel Brushing.*—This is the easiest of all brushing materials, especially the varnish. You need not rush, in fact, you must not rush your work, as the materials require a good brushing out to cover the surface thoroughly. The surface must be sanded and dusted well and cleaned with a tack rag (rag soaked in oil varnish and hung up to get tacky) before it is placed into the finishing room for coating. The tack rag is the finest thing to pick up the little dust particles left by the duster, and any little particles of dust will leave a rough place in the varnish when dry. Sufficient dust will collect on the surface no matter how careful you are in cleaning up and sprinkling the floor and having all your clothes and tools free from dust.

For obvious reasons there is little difference in applying enamel or varnish, enamel being a pigment ground in oil with varnish and having the same general qualities as to flowing and drying. If anything enamel sets quicker owing to it being heavier material and cannot be brushed out as much. The next paragraph, on varnish brushing, can be referred to for enamel brushing.

Almost anyone can brush on varnish without getting a rough surface, but there are many things to keep in mind to get the right kind of a job. The varnish must be laid on with a soft, thick, chisel-type brush. This brush must be clean at all times and kept in a solution calculated to keep the brush in excellent shape. Seldom thin varnish for brushing. It is intended to be used just as it comes from the original package, and many varnishes lose their drying qualities or gloss by thinning. They should be right to use as they come, but in very cold weather they should be heated by steam or hot water before using so they will flow out well.

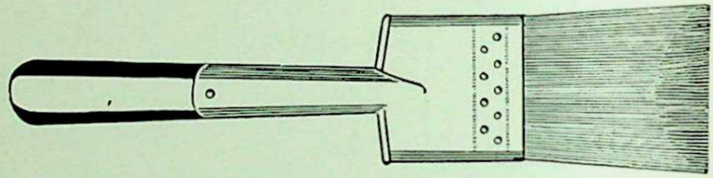


Plate XL.—Varnish Brush.

Dip the brush in the pot and work it around until it is thoroughly saturated with varnish and then wipe on the bail or edge to take off surplus material and then apply to the surface, brushing back and forth and criss-cross until well worked into all the pores and does not pull away from any spot covered. After a surface is covered and brushed out well, draw the brush with the grain all the way across the surface at least twice to make the brush marks with the grain. Be sure that the brush does not leave surplus material to run down the edges or sides of a piece. Pick up all runs and sags and retouch all places skipped.

### DRYING TIME FOR SECOND COATERS

Ordinarily one would not coat a piece the second time in the same day, but there are times when this can be done and must be done to speed up production or finish some piece hurriedly. All lacquer coatings, whether clear or opaque, can be surfaced any way in about six hours. Where forced drying is used, they may be surfaced in from two to four hours. The same is true of all spirit varnishes, as for example, shellac. All of the above-mentioned materials dry by evaporation of the volatile ingredients.

Oil varnishes and enamels are very slow-drying on account of the oils they contain which must dry by oxidation, and for this reason the drying time of these materials depends on the thickness of the coat and the amount of heat employed for their oxidation. In ordinary room temperature, few varnishes or enamels will dry for surfacing in less than twenty-four hours. By forced drying, with 100 degrees or more, the drying may be accomplished in from eight to fourteen hours.

The test for surfacing second coats will be to press the palm of the hand heavily on the surface for at least one minute, and if no impression is made, you can safely sand or rub the surface with any material with the possible exception of oil and pumice. The oil has a tendency to soften a green varnish not sufficiently aged.

### SURFACING SECOND COATERS

*Shellac or Spirit Varnishes.*—Sanding with dry garnet finishing paper, grade 5/0 or 6/0, is the proper way to surface this material if another coat is to be applied. Refer to the paragraph on dry sanding in Chapter VI for method of sanding. If this is to be the last coat, refer to the next paragraph on surfacing lacquer finishing with pumice stone FF and rubbing oil. It is assumed that a satin or dull finish is desired with a two-coat finish in shellac or spirit varnishes. Oil and pumice rubbing is about the only way shellac is finished.

*Lacquer Material Rubbing.*—If another coat of lacquer is desired after the second coat, use a waterproof garnet finishing paper, about 5/0, and do a smooth, quick job. This paper cuts off a surface quicker than any known abrasive and is very effective in skilled hands. A sponge and chamois with plenty of water are necessary when surfacing in this manner. Dip the sponge in water and cover a small surface at a time with water. Place a piece of the paper between the little and third finger and with the hand flat on the surface sand systematically with the grain of the wood, overlapping each stroke and working from one side of the surface to the other, keeping plenty of water under the paper at all times. Clean off the surface with the sponge and wipe off with the chamois to inspect. The operator can tell, after practice, when he has sanded sufficiently without wiping off, but frequent inspections are necessary for anyone not habitually at this kind of work, as the hand is not trained to feel a smooth surface. Much care should be exercised in sanding with waterproof paper, and above all, keep away from the edges until you learn how much pressure can be put on the paper when near the edge. Little pressure need be put on this paper for water sanding—it cuts fast. If the gloss is worn off the surface it is usually sanded enough.

Steel wool of grade 00 is used to a large extent in shops for surfacing the first coat of lacquer material and sometimes for the second coat, and especially when another coat is to be applied, but the waterproof paper has the advantage of making a smoother surface on flat surfaces and not clogging up as easily. Machines are made for rubbing with garnet finishing paper, steel wool, or pumice stone. These machines work back and forth the full length of the surface and many of the smaller type machines oscillate with two rubbing surfaces working back and forth and the machine is moved back and forth over the surface. Steel wool or a rubbing brush is used on uneven surfaces such as carvings or any surface that cannot be reached with finishing paper or any other surfacing material.

Pumice stone FF and water can be used for a second coat of lacquer material provided the coat is to be extremely dull or another coat is desired, and the same method of use, as described in the following paragraph on oil rubbing with pumice stone, except water causes it to cut quicker. With water and pumice a sponge should be used to clean the surface and a chamois to wipe dry for testing.

*Oil and Pumice Stone Rubbing.*—Select the proper grade of pumice stone and a clear rubbing oil. Have the oil in a flat vessel and add the pumice to it or else sprinkle the pumice over the surface after dipping the felt pad into the oil and covering the surface. Be sure the pumice is well distributed on the surface or pad before much pressure is placed on the rubbing felt, otherwise deep streaks may be made by ridges of material on the pad. A good smooth back-and-forth rubbing, lapping only when necessary, will produce a good satin finish. Oil rubbing must not be done in any instance unless it is the last coat. In production shops only a light sanding with fine, dry sandpaper to remove dirt nibs is done on first or second coats, and the main surfacing operation is on the last coat.

## SURFACING ENAMEL OR VARNISH COATS

All the methods mentioned for the surfacing of lacquer can be used for either of these materials, and conditions have a great deal to do with the selection of surfacing material. It would seem logical to use a waterproof paper or pumice and water if dust is to be avoided and you are obliged to surface in the same room where pieces are coated. The use of water with any of these materials precludes the immediate coating of the piece, as at least two hours should be allowed in a warm room after washing off a piece with water. On the other hand, no dust will be flying in the air as is the case with dry sanding with finishing paper or steel wool.

Oil rubbing is to be suspended until the last coat, but if such a thing as getting a surface of any consequence is accomplished in two coats, you can surface with pumice stone FF and oil.

# CHAPTER VIII

## FINISHING COATS

IT HAS been customary to finish a piece of furniture with the same kind of material as the second coat, and with the advent of lacquer finishing, every coat is of this material, so that the only difference between the coats is the manner of surfacing.

### SHELLAC OR SUBSTITUTES

If we take into consideration the finishing of furniture with shellac or other spirit varnishes, the decision would be to finish with this material if a shellac finish is desired. Of course shellac is not heatproof or waterproof, and for that reason is not used in most factories. It dries very hard, however, and seldom press marks, but will mark from hot dishes when the melting point is approached.

Any of the shellac substitutes are much less desirable for a finishing coat, although they do very well in some cases for first coaters. They are usually made from resin gums of low melting point, and while they rub to a very good finish, they will not stand hard usage and will mark easily.

The application of the finishing coat is the same as any of the preceding coats with the exception that more care must be exercised in spraying or brushing. Every spot must be covered and there must not be any sags, runs, laps or flooded places. There is no question as to whether it is best to brush or spray the finish coat, as the spray method always will produce the more even finish, eliminating the brush marks attending the brushing of spirit varnishes, and giving a better covering. However, if the spray cannot be used, brushing can be accomplished with good results if the material is thinned and great care and speed used when applying it. Coat from top to bottom, and if using a spray on horizontal surfaces, start at the edge closest to you and work away to prevent overspray covering the finished work. With either brush or spray a good wet glossy surface must be had to be sure to have sufficient material on for a good rubbing.

### RUBBING SHELLAC FINISH COAT

Shellac is a hard material to surface, and it is literally hard. Some object to using shellac because of this, but there is little difference from rubbing lacquer. It is better to sand with finishing paper of a fine grade, or rub with steel wool, to knock off the high places, if the finish coat has been applied with a brush. After the preliminary sanding use FF pumice stone and rubbing oil on a felt pad either attached to an oscillating rubber or use by hand, rubbing back and forth on the straight surfaces until you have produced the desired results. Wipe off the surface at intervals to see if the surface is rubbed sufficiently.

If rubbing cabinets that are paneled, rub the panels first and afterward the frames. All carvings and inaccessible places must be rubbed with a regular rubbing brush and little rubbing is necessary in places of this kind. Dip the brush into a mixture of oil and pumice and rub over the carvings briskly but very little in one place. When you have covered the surface twice, clean off and inspect. Benzine or naphtha are excellent for cleaning off pumice and oil and should be brushed on and wiped off with waste or rags. The rags or waste should be very clean and not contain any material that will scratch the surface. Wipe off with the grain when possible.

Wipe off straight surfaces with the grain, and under no circumstances wipe or rub in careless circles or across the grain. Remember the little mark or scratch made with the grain does not show, but across the grain is plainly visible, and so all rubbing must be done with the grain. It will require a great deal of rubbing with oil to get the same results as can be obtained with water, but water is not generally used on the last coat as it produces too dull a surface. Oil with pumice stone gives the satin finish.

### VARNISH FINISH COATS AND RUBBING

Varnish should be applied over a second coat of varnish, so the specifications should read: Shellac, sanding, varnish, sanding, varnish and rubbing. This is the tried and true method of getting an excellent varnish finish in dull, satin or high polish finish.

Plate XLI.—Using Pressed Felt Pad in Rubbing with Pumice or Rotten Stone Mixed with Oil or Water.

If sprayed on, the varnish should be warm so that it will flow out as smooth as possible without pitting, so in buying a varnish for spraying be sure to get one recommended for a finish coat. To get the best results it should not be quite so heavy as the second coat. If possible spray all the surfaces on a horizontal plane, for much running of the varnish will be noticed unless the operator is an experienced hand. It is frequently possible to get the most of any piece horizontally, especially the front, and all removable pieces should be laid in this manner. Spraying on a horizontal surface is likely to promote puddling and slow drying with an inexperienced spray hand.

It is well to use the tack rag, referred to in the previous chapter, and pick up all dust particles on all pieces before varnishing, and when finished rush them into the drying room. Varnish should remain from eight to twenty-four hours, depending on the heat and drying qualities of the varnish, before rubbing. A good test for rubbing is to press the hand lightly on the finish, and if it does not mark in thirty seconds, you may rub with safety. A lot of varnishes used in production shops should not be rubbed in less than two to five days.

### RUBBING VARNISH FOR DULL FINISH

To secure the dull finish use FF or FFF pumice stone and water on felt rubbing pad and rub the surface until smooth. Plenty of water must be used on the surface at all times to prevent heating and rolling of the varnish. Rubbing must be systematic and not spasmodic. Make regular strokes back and forth with machine or hand, as the case may be. Remember the machine was made to do the labor once done by hand, so use it whenever possible. Oil rubbing may follow water rubbing for a satin finish to prevent a grayish appearance.

Rubbing varnish properly requires constant practice, and while many may do a satisfactory job by following directions, few perform good work in a reasonable length of time without much practice.

Stay away from the edges until the last and then touch them lightly, for they cut through at the first touch if it happens to be heavy enough. The ends of any straight surface, where it breaks off abruptly, as the ends of dresser tops, etc., should be rubbed at first across the grain so that you need not press so hard when rubbing with the grain.

Round surfaces should be rubbed with a burlap or soft pad. Some of this is done on a lathe, as lamp stands, for instance. Carvings and other rough surfaces can be dulled sufficiently by a dulling or rubbing brush.

After the surface has been sufficiently rubbed, clean up with a sponge and chamois. This must be done as you rub to ascertain if the work is completed. Care should be exercised in the amount of rubbing to a given surface, and if you want to be sure you are not rubbing too much, count the strokes you make on one part of your surface, and when an inspection proves you have a good finish, then use the same amount of rubbing on the rest of the surface with the same pressure on the rubbing pad. This can be managed very nicely with a machine as the pressure will be the same, but using the hand method one is apt to relax the pressure or increase it at intervals, making an uneven surface. As said before, the only way to accomplish good results in rubbing is to do a great deal of it until you have mastered the stroke and pressure. Never make over two strokes across a table or cabinet top, but you can finish one side at a time, and changing to the other, make a lap on the strokes at the center.

### SATIN FINISH ON VARNISH

This finish is by far the most popular of the three finishes. The dull finish may hide a multitude of sins, but it does not enhance the beauty of the grain, but rather gives it a dead look. The little we see of dull finishes can be traced to antique or imitation antique.

Highly polished furniture was the rage only a few years ago and it will come back again, for this is the only finish that brings out the full beauty of the wood. The satin finish is the most popular for other reasons. This finish is between dull and high polish, in fact, just off the polish. There are many degrees of dullness to this finish, and they may be varied by the amount of oil and pumice used. If a near polished finish is desired, add a little rotten stone to the pumice and use with oil. In this way a good polish is secured and yet have the satin finish from the fine scratching of the pumice.

A dull or satin finish is the series of fine scratches of the finish with the grain, and when made straight are not so noticeable. For an extra fine finish of this kind FFF grade of American ground Italian pumice should be used, and not the coarser grades of domestic stone. The domestic stone sometimes contains mica which will scratch the finish and ruin it.

Considerable rubbing effort must be put forth when using the fine grade pumice and rotten stone mixed because the cutting power has been reduced, nevertheless care must be exercised and the work cleaned off with naphtha quite often and inspected. The same machines, felts, stone and brushes are used for satin rubbing as are used for dull or high-polish rubbing. All carved or turned places must be hand-rubbed. Satin finish is the one used on lacquer, and this is the chief way this material is finished.

Varnish takes the finest satin finish of any material for the reason that the flowing out of the varnish and the absence of pinholes in the surface gives an excellent surface to rub. The finish should have a perfectly smooth appearance, without deep lines from rubbing, and no holes or shallows in the surface. Select the finest American-ground Italian pumice stone, of FF grade, and a clear rubbing oil of neutral or paraffine oil, and a woven felt to fit the hand or fastened on a wood block by glue, and proceed to rub all flat surfaces, concave or convex. The round surfaces and mouldings are usually rubbed separately and in a different manner. As mentioned before, rub with the grain and not across it, for the scratches are not noticed when made regularly with the grain.

The amount of rubbing necessary to produce the satin finish can only be determined by the appearance, and the piece must be wiped off for inspection after each rubbing to ascertain if sufficient rubbing has been done. Concentrating on any particular portion must only be done when it seems that the coating at this point is thicker than the balance of the surface being rubbed.

Frequently it happens that one begins rubbing a surface when it is a little too green in places, although the portion inspected for dryness seems in perfect condition. This occurs when some portion of the piece has been flooded with the spray or an extra quantity of varnish has been brushed on. When using the same material continuously it will be found that rubbing can be done within a certain limit of time, say, within twenty-four hours, and when a regular schedule is made, little trouble will be experienced in this direction. Where different varnishes are used from time to time, some experimentation will be necessary as one is not familiar with the product, and for this reason one should standardize on a good material and not change unless some advantage can be obtained over the material in use.

Machine rubbing offers all the same problems except that the pressure is usually even over the entire surface, but it is easy to allow the machine to rub through if not watched. The pad can be soaked with oil and sufficient pumice applied to it to cover the average surface of two or three feet square for one rubbing, but it is better to cover the surface with oil and sift pumice powder over it.

## HIGH-POLISHED SURFACES

In olden times, and even now in Europe, French polishing is used for producing high-polished finishes. This method is explained thoroughly in Book IV in the chapters on patching. Today this method is too slow, and prohibitive on account of the high cost of labor. Of course many pieces are polished by frenching the surface with some of the many products for this purpose, but this is only done in a small way and the methods used by furniture, and especially piano, factories for polishing are by a process of rubbing with rotten stone mixed with oil or water.

## OIL POLISHING WITH ROTTEN STONE

When a surface has been rubbed with a fine grade of pumice stone with oil it is very easy to wipe off and begin rubbing with a soft felt and rotten stone until a high polish is produced. Not so much care is needed as regards rubbing too much, for it is easy to tell when the surface is polished, as the rotten stone does not scratch, but merely by friction polishes the surface, and the cutting power is negligible compared to pumice.

Of course the same periodic inspection must be made in rubbing a surface, to ascertain if the degree of polish is attained, and it is best to make two rubbings for the purpose of polishing and clean off each time. After the first thorough rubbing, the spots that seem to be duller than the balance of the surface can be rubbed up to match the balance and then proceed with an even rubbing for a finish. One should be careful to clean the surface thoroughly when through. Oil rubbing with rotten stone is best done with a soft felt and brick rotten stone, as the brick is not so liable to contain dirt or scratchy substances which is sometimes found in the powdered form.

### WATER RUBBING WITH ROTTEN STONE

Most all piano polishing is done with water, pressed felt, and rotten stone brick. When this is done the preceding coat is usually rubbed with water and pumice stone. If oil has been used on a preceding rubbing, it will be found more difficult to rub with water over this as water will not spread well over oil and you lose the lubricating power of the water until the oil has been removed and, of course, this requires more time.

The felt for water rubbing with rotten stone should be pressed, and for hand rubbing, about one-fourth inch thick. This may be attached to a block of wood for flat surfaces and a like piece used for rubbing curved surfaces. For machine rubbing a piece of felt to fit the rubbers is required. Plenty of water must be supplied to the pads all the time and rotten stone must be rubbed on the pads whenever necessary.

It is much easier to wipe across the surface with the palm of the hand when rubbing with water and thus clean a spot for inspection, and when the surface has been rubbed to a beautiful high polish, clean off with sponge and chamois.

## RUBBING ENAMEL AND LACQUER

The rubbing of enameled or pigment lacquer surfaces for the finishing coat is done in the same manner as the rubbing of varnish or clear lacquer. The same care on edges, if pumice stone is being used, and the same frequent inspection are required to get the best results. The use of waterproof garnet paper in finishing is sometimes employed and may well be used on pigment lacquers. The use of this paper with plenty of water prevents any rolling up of the finish, even though it may be a little soft. However, the best results in rubbing or sanding with any material can be had only with a strictly dry, hard surface.

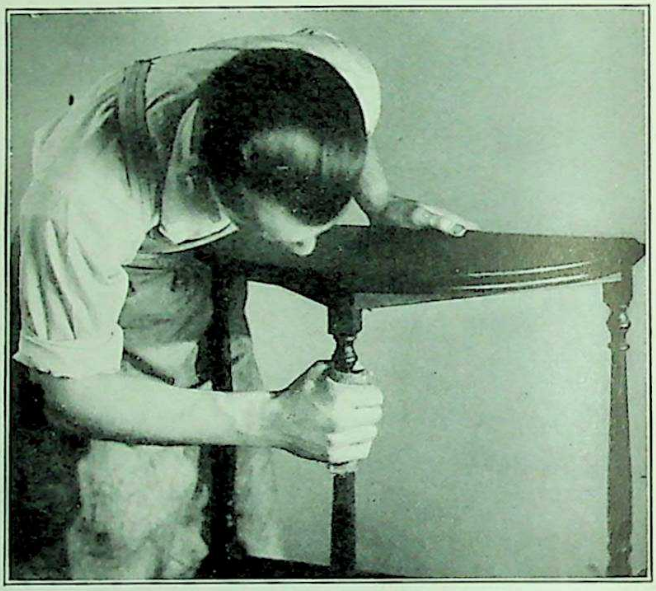


Plate XLII.—Using Burlap for Rubbing Turned Surfaces.

If waterproof garnet paper is used for surfacing the finish coat, nothing less than 4/0 to 7/0 paper should be used. Take a sponge full of water and cover the surface with water. Have the paper on a felt or cork block with rounded edges to prevent cutting through at this point, and sand back and forth with the grain, overlapping each stroke with the previous one, enough to be sure of dulling the entire surface as you go along. Little pressure is needed with this paper for the cutting power is tremendous compared to pumice stone and oil, and the work can be accomplished much quicker in this way. Of course the work will have a very dull appearance and must be polished to some extent with oil and pumice or a mixture with rotten stone unless, of course, the extreme dullness is what is desired.

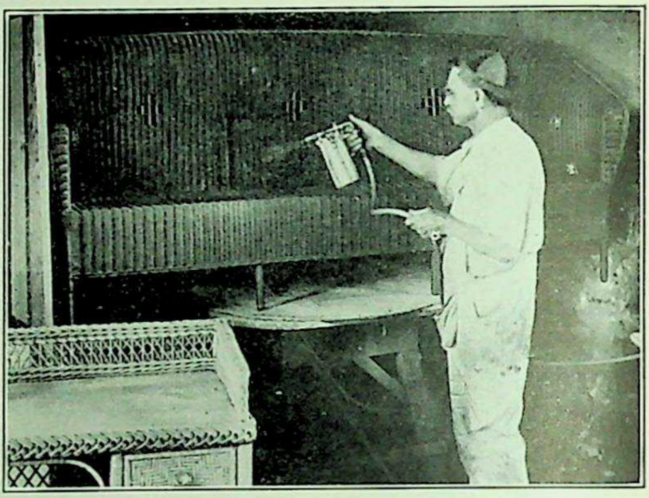
Machines are equipped to use this paper, both the large rubbing machine and the small hand oscillator, so no one need hesitate to use this material. This manner of hand surfacing is done almost altogether now in automobile, and to some extent, in furniture finishing.

## FLAT COAT MATERIALS

In production work on cheaper grades of furniture we find much use of flat varnish, flat lacquer, and occasionally egg-shell enamel. The use of these materials avoids much rubbing, especially on the obscure portions of furniture and on office furniture, and yet give the appearance of a dull-rubbed finish. Flat coaters are applied usually with the spray gun, in the same manner as the gloss coatings, but care is exercised not to get any runs or sags to avoid rubbing or sanding. The first coat can be sanded if desired, but usually the coats are applied over each other, and not more than two coats over a coat of stain and filler are common.

The flatness of lacquer is obtained by shifting the formula of a regular lacquer. The addition of alcohol or acetone will sometimes produce a dull effect to a regular gloss lacquer. Of course this addition must be an experiment and will not always work. It is better to buy a flat lacquer if much of this material is required.

Flat varnish usually contains wax to produce the dullness, but it is preferable to buy a flat varnish that does not contain wax so that a rubbing varnish can be used over this coating if desired.



COURTESY OF ECLIPSE AIR BRUSH CO.

Plate XLIII.—Spraying Wicker Furniture with Colored Lacquer. Material in Cup.

# CHAPTER IX

## REMOVING VARNISH AND REFINISHING

### REMOVING VARNISH

REMOVING varnish and paint from old furniture is a considerable part of the finishing business. In many cities about all the shop work is confined to refinishing old furniture and transformations, like glazing and enameling. Even factories must remove varnish when goods are shipped back, due to damaged finish or special order work.

There is little difference in material or method in removing varnish, lacquer, shellac or enamel. Many good brands of solvent, or varnish remover, are on the market, and while most of them are disagreeable to use, few of them are injurious. If one uses rubber gloves with a pair of canvas gloves over them, all the precaution necessary will have been taken to insure no injury to the hands. A common formula for removing varnish can be made as follows: 40% benzole; 35% denatured or wood alcohol; 25% methyl acetone, adding ¼ lb. paraffine wax to each gallon of the mixture. The wax is melted and added to the benzole before cooling, and is then added to the other liquids and agitated thoroughly. This mixture must be agitated thoroughly before using to insure proper mixture of wax in the solution. Unless one is using large quantities it is not profitable to make varnish remover. Lye solutions should not be used as they do not have any advantage over solvents on the market and are sometimes injurious to the wood, and moreover burn up everything they come in contact with, especially one's hands and clothing.

There are two ways to remove paint and varnish with varnish solvents. A piece of furniture can be suspended into a tank of the solvent or the solvent can be laid on with a brush. If suspended into a tank solution, an easier job can be made of it, but this method is wasteful unless the pieces are small and one has a great deal of it to do. It is obvious that a more thorough job can be made in less time than by laying the solvent on with a brush. But the saving of material does not amount to much, if anything, as the tank becomes loaded with waste material, and when it ceases to be active it must be replaced with new solvent. Paint and enamel require more time than a thin varnish coating. A piece should not be left in longer than is necessary to soften the varnish or paint and should then be wiped off very quickly with waste, rags or any other absorbent material.

If much removing is to be done it is advantageous to have at least two tanks containing solvent, and the last one minus any wax, so that when a piece is cleaned off the second time, it will not be necessary to apply a wash coat. The second tank must be covered tightly to prevent evaporation.

Most varnish removing is done by the brush method. All surfaces must be horizontal, if possible, when applying the solvents, to prevent the running of the material and breaking through the wax coating that forms over the top of the solvents to prevent evaporation. In cabinet pieces all drawers, doors, mirror frames (glass must be removed previous to this operation, also hardware), and in the case of pianos, all boards must be removed and laid in a horizontal position before applying the solvent. Most all cabinets can be turned into a horizontal position for all surfaces. When a piece is ready to cover with solvent, select a rubber-set brush, two to four inches wide, and having long bristles, dip into the solvent and lay on the piece, starting at the farthest point away and covering thoroughly until the whole surface has been covered, without skips. If the solvent does not remain soft at least three minutes, it is either a poor product or else you have failed to agitate it as directed to insure proper distribution of wax. Be careful not to brush the solvent out any more than is necessary to cover the surface, as the more it is brushed, the quicker it evaporates through the film and gives one little time to remove it.

The removing should be done when the coating is soft and not sooner. The only exception might be where the paint coating is so thick as to prevent a clean job with one application and must be repeated. From three to five minutes will suffice to soften the average coat.

In removing paint use a flat-edge steel scraper or broad putty knife to scrape up most of the material and a wood straight edge to wipe off all flat surfaces. Caution must be used with a sharp scraper on open-grained woods, as oak, walnut or mahogany, not to go against the grain, as a splinter might be taken out, whereas if the scraper is always moved with the grain, this cannot happen. It is not necessary to use a sharp scraper on varnish or lacquered surfaces, as the varnish should remove easily with rags or waste. Occasionally coarse steel wool is used in carvings or mouldings to scrub out the recesses, and a putty knife can be used carefully when cleaning out around panels.

A wash coat of benzole is often used after removing, to clean up any wax that has been left on the surface. This is good practice, especially when one expects to use a water stain, as wax is an excellent material for shedding water. Flow on the benzole liberally and wipe up with absorbent cloths as soon as possible, taking a small surface at a time. If lacquer is to be used as a coating, use lacquer thinner, never benzole, benzine or naphtha. It is important that all traces of the wax be removed from the wood before refinishing, otherwise it will prevent the new finish from sticking and may seriously interfere with the drying.

A sanding operation, while not always necessary, is advisable in most cases where a first-class refinishing job is expected and where one wishes to be sure it will not chip off later. Nothing is better than 3/0 garnet finishing paper for this operation. Sand with an even pressure, with the grain, the full length of the surface, moving from the farthest edge toward you with each stroke, until you have covered the surface thoroughly. Too much care cannot be taken in this sanding, as a spot sanded considerably more than the surrounding surface will take stain a great deal darker than the rest of the surface and the finish will be spotted. All the varnish or paint coating should be removed thoroughly before this sanding, so that it will not be necessary to sand one portion more than another. When working on rounded or carved surfaces, No. 1 steel wool can be used with good results.

## REFINISHING

The following is a list of stains used in refinishing old or new furniture:

*Water Stains.*—Water red, water brown, auramine yellow, nigrosine crystals jet, walnut crystals, malachite green crystals and methylene blue.

*Spirit Stains.*—American walnut, Bismarck brown, golden oak, fumed, nigrosine jet and the yellow and green referred to under water stains which are soluble also in alcohol.

*Oil Stains.*—Red, brown, yellow, orange and black are practically all the oil aniline stains used in refinishing.

In refinishing old pieces, the first thing to consider is whether it is to be a darker shade than the original or a lighter shade of the same color; or if the color is to be changed entirely or a lighter finish of different color.

First, we will consider making over a piece of oak, originally finished in golden or natural finish, both of which are light, into a Jacobean finish. The golden is a shade or two darker than the natural. After removing the varnish and sanding, prepare a dark brown aniline stain by mixing about one ounce of oil brown to one quart of a mixture of three parts naphtha and one part benzole (the latter liquid will allow penetration), and add color or naphtha as necessary to produce the desired shade. Try it out under a coat of shellac or varnish applied to an obscure portion of the piece. Be sure that plenty of light is on the surface when making this trial.

Second, we will consider making a brown mahogany finish on a piece once stained a deep red. This may be on mahogany, birch, maple or gum wood. On mahogany an oil stain could be used after bleaching. This is treated with benzole before applying so as not to produce raised grain like water stain. If water stain is to be used on mahogany to produce a brown shade over a former red surface, use a straight brown stain (one ounce of powder to one quart of boiling water). Try this on an obscure portion and flow a little shellac over it to test for shade. If the red is killed sufficiently to give the right brown, add yellow for a light shade of brown, or black for a darker shade. Either will kill the red, and sometimes a little of both will make a more balanced mixture. Too much black and yellow will produce a green effect, therefore care must be used in making a color to go over another. Instead of bleaching, a spirit stain in black and yellow may be used to produce the right brown. You will not be able to get a real light shade, but a dark brown can be had by using an American walnut spirit stain with the addition of a small amount of black to offset the red in the wood. For the latter mixture, use one ounce of stain to one quart of alcohol, varying the proportions until the right shade is had, after covering with oil varnish to test the resulting color.

The same methods can be used for birch or gum, but often the water stain will not penetrate deep enough and spirit stain must be relied upon. It is very difficult to produce a lighter shade on any wood where the former stain has been produced by the use of acid stains for the reason that the acids unite chemically with the composition of the wood and penetrate to a great depth. This condition will be found on many antiques. If you fail to make a lighter shade by bleaching, it will be well to cease trying and make just a shade darker than the original finish, or if not spotted, you can finish the same color. Walnut is always finished in some shade of brown and can be bleached as a rule. Owing to its open pores it can be stained with either oil or water stain.

Certain rules must be observed in the application of stains to secure easy application, true shades and uniform finish. It must also be remembered that the succeeding coats, to a large extent, govern the choice of stains. For instance, if one wishes to finish a piece of furniture in a lacquer finish and use nothing but lacquer over the stain, there is nothing else to do but use a water stain which will not be moved by the lacquer. Any stain dissolved in alcohol, naphtha, benzole, etc., will be moved by the lacquer. We might also add that shellac will move a spirit stain, but not an oil or water stain. Oil varnish will move an oil stain, but not a spirit or water stain. Thus several combinations of stain and first coaters are possible.

As to colored woods it is obvious that any color must be darkened to obtain the same shade on a light-colored wood as would be produced on a dark-colored wood before darkening the stain. Therefore, either a red, brown or almost any stain mixture requires a stronger mixture of powder to the liquid each time it is applied to such woods as walnut, red gum, mahogany, birch, maple and beech, in order that the last named wood would be the same shade as the first. To make this a little clearer, let us assume that a brown water stain is made up for walnut, and it is desired to produce the same shade on a piece of mahogany. Add water brown stain to this mixture in liberal proportions or add water black nigrosine in a small amount to get a stain just enough darker to produce a brown on the mahogany to match the walnut.

Another important thing to remember is that new wood takes stain darker and much deeper than old wood, previously finished. For example, suppose an old mahogany dresser or chest of drawers is to be matched with several new pieces to form a bedroom suite. Stain the old piece first in order to produce the shade desired, as the new work will take the stain to any shade desired. The stain must be made much weaker, by addition of solvent, before applying to the new pieces, and then an accurate test must be made of both pieces in the same kind of a light to be sure the match is correct.

## MAKING BROWN MAHOGANY OVER RED

Many finishers have difficulty in obtaining a good shade of brown mahogany over a red mahogany stained piece of furniture. A very easy way to get the desired results is as follows:

After removing the old finish, and sanding, prepare a very weak solution of water stain in green or else make a solution of yellow and add blue until you have a bright green. The mixture of these strong colors must be carefully made and the work must be tested until the exact shade is secured. Blue and yellow, two primary colors, if added in the right proportions will make any shade of brown desired. It is assumed that the shade of red on the wood is very light after removing and sanding, so too much emphasis cannot be laid on making a very weak solution.

Sponge the wood with hot water, let dry and sand off the raised grain. Apply the water stain quickly and evenly over the entire surface. It is frequently necessary to wipe off with a half dry sponge or waste, partially wet, to get a uniform surface.

For testing color cover an obscure portion of the piece with a coat of shellac and expose to a strong light. If the shade is too green, wipe over a solution of bright red and test again, and if too light a brown, add either black stain or strong brown to the solution and go over it again. It is sometimes necessary to cover the surface with red to make it uniform, if sanded too much in spots.

### VARNISH CHECKS REMOVED

There are several materials on the market under such names as "amalgamater," "check eradicator," "knitteen," "flo-var," etc., for removing checks in varnish without removing the varnish. These materials can be brushed on any varnished surface, but the best manner of application is to spray them on. The surface must first be sanded with waterproof garnet paper, 3/0 or 4/0, using plenty of water. When this has been washed off and dried with a chamois, the surface will be cut up sufficiently to allow penetration of the liquid and at the same time clean the surface thoroughly. Allow six hours for drying before flowing the surface. When spraying or brushing these materials notice the effect; for most of them work better if not brushed out but flowed onto the surface as heavy as possible.

*Finishing.*—After at least twelve hours drying sand the surface with 5/0 garnet finishing paper and clean off well. Flow over this surface a heavy flow coat of a good grade of cabinet rubbing varnish, or in the case of dresser or table tops, use a very good grade of table-top varnish, in other words, a cabinet spar varnish. This last coat must be allowed at least twenty-four hours for drying at moderate heat, or more if finished where the temperature of the room falls below 75° F.

*Rubbing.*—The rubbing process is the same as outlined in Chapters VII and VIII, Book II. Steel wool can be used over the first coat for cheaper work, and avoid the varnish coat.

### COVERING OLD SURFACES

To cover old surfaces without removing the varnish sand thoroughly with 4/0 waterproof garnet paper, clean off with water and wipe dry with a chamois. Allow four hours for drying before coating.

Following coats over old surfaces must be correct materials. Shellac or any spirit varnish should not be applied over oil varnish or enamel. Varnish is seldom used over lacquer, or varnish enamels over lacquer enamels, neither should the reverse be applied, for instance, lacquer materials over varnish materials, unless a crackled surface is desired.

All holes or abrasions must be patched before coating over an old surface and just before the last coat (see Book IV, on *Patching).* The same rule applies in coating old surfaces as in finishing new pieces, only the undercoat must be tested for the kind of material.

The turpentine test for varnish or enamel materials will result in the softening of such materials, whereas all lacquers and spirit varnishes will remain hard. Submerge a portion of the piece in turpentine spirits for twenty-four hours, or cover a portion with the spirits and the result will be the same, unless the varnishes are unusually hard.

Turpentine will dissolve wax and this can be removed by wiping with a rag, and then the test for varnish can proceed as before mentioned. Always sand an old surface before coating.

If you feel that the surface you are about to coat is lacquer, and you wish to coat over it, the best way to decide the question is by coating over an obscure portion with some lacquer brushing material, and if it does not peel off or check, it is safe to proceed. Brushing lacquer has become very popular for refinishing old pieces of furniture and some information on its use will be timely. Do not brush lacquer material over a varnish surface unless you have a material that you know will work satisfactorily. On removed surfaces use nothing but water stain under clear lacquer.

Be sure you have patched the surface to be coated, as outlined and instructed in Book IV, and that the surface is clean and thoroughly dry. Apply the lacquer as fast as possible, being sure to cover well as you go along, as these materials dry too fast for slow work and touching up. Be sure not to overlap any previous coating when working on a piece of furniture, and cover a small surface at a time without allowing time for setting of a brush stroke before applying another. There must be no recess when applying lacquer—stay with it until the job is finished.

*Staining Over Old Surfaces.*—The use of spirit aniline stain over old surfaces has long been the practice in cheaper work, and the best method of application is by adding to a coating of lacquer or shellac enough stain dissolved in alcohol to give the correct shade. Oil aniline can be dissolved in turpentine and added to varnish, or dissolved in toluol and added to all lacquers. These materials are seldom used unless the work will not admit of the cost of removing and refinishing. Pigment in oil or japan is also added to varnish or enamel coats. There is little to recommend this kind of refinishing, but the cost of some refinishing is more than the value of the piece, yet it is desired to change the color of the finish. In the case of oak made to imitate mahogany, it is necessary to use color in japan and added to varnish to give sufficient covering to hide the prominent grain of the oak. A more thorough method is to use a ground coat of red and grain over this before varnishing. See index for *Graining*.

### BLEACHING WOOD

There are many cases both in finishing and refinishing where it is necessary to use some form of bleaching solution in order to make the wood lighter. In the case of walnut, it is bleached to make what is known as the French walnut finish. Gum and oak are sometimes bleached before finishing, but the use of a bleaching solution will be of more use in refinishing where it is necessary to bleach the wood to make a lighter shade, thus taking out a dark stain.

The bleaching solutions are acid or alkali. The acid solutions are injurious to the lungs when sanding the wood afterward and the alkali solutions require some acid wash over them to neutralize the alkali so you can finish over them. If one will wash off the acid with water after bleaching and before sanding, the dust will contain very little acid.

### BLEACHING FORMULAS

Oxalic acid crystals, dissolved in as much warm water as will take the crystals up in solution, make the best bleaching formula. One pound of sal soda in a quart of water makes another effective bleach. Peroxide of hydrogen is very effective on small ink spots or stains, but is rather expensive on large surfaces.

*Application.*—Any of these bleaches can be applied with a brush and allowed to dry. A second application, and sometimes a third is necessary in refinishing. The surface can be sanded off, but it is better to wash off the solution and allow to dry before sanding. Sanding is necessary because the grain will be raised considerably. After washing off the bleaching solution and before sanding, a very thin wash coat of shellac can be brushed over to stiffen the fibers before sanding.

# BOOK III

# Furniture Decoration

# BOOK III

## CHAPTER I

### FURNITURE DECORATION

IT IS in the time of Cicero that we read of a desk costing the modern equivalent of $45,000, worked out in intricate inlayed patterns of cedar, boxwood, holly, cherry, ivory, horn, tortoise shell, gold and silver. During the Middle Ages the heavy, sombre Gothic styles were relieved by symbolic and geometrical carving; later the Italian Renaissance period gave to the world polychrome and during the Restoration in England arose the passion for Oriental lacquer work, raised landscapes in gold and silver on backgrounds of rich blue, red, green and brown.

Thus the embellishment of furniture to disguise its utilitarian purpose is no new thing with mankind; it is in the manner in which we carry it out today with new materials, equipment and methods that the most interesting difference lies. Nor is furniture in this age an appurtenance only of the rich and powerful as it once was—the most humble can obtain at a price within reach what in former days would have been beyond aspiration.

### HIGH-LIGHTING AND SHADING STAINED WORK

The process of high-lighting, or blending, or shading, as it is variously known to finishers, is based on a desire to duplicate as far as may be possible on new furniture the worn effects we observe on antiques which have undergone years and years of use, thereby taking on an agreeable variation of coloring which enhances the beauty of the piece. The greatest skill is required in the high-lighting since it should be applied only in the centers of panels, along mouldings, chair and table rails and on raised carvings and turnings, blending out gradually to the shaded surrounding area in a degree proportionate to the size and design of the portion so treated.

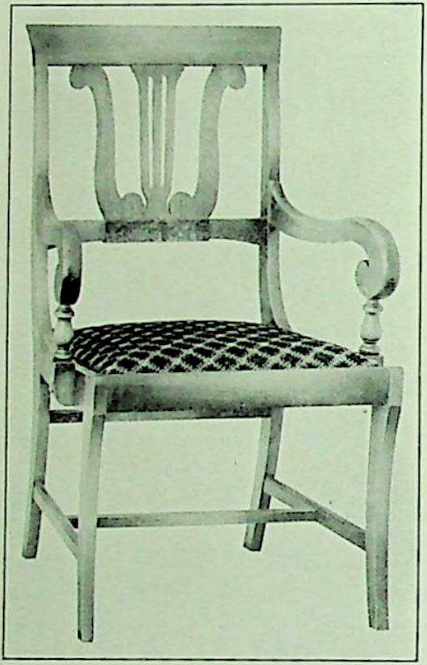


Plate I. — Walnut and Gum, Spray-Shaded Armchair, Stained Directly on Wood.

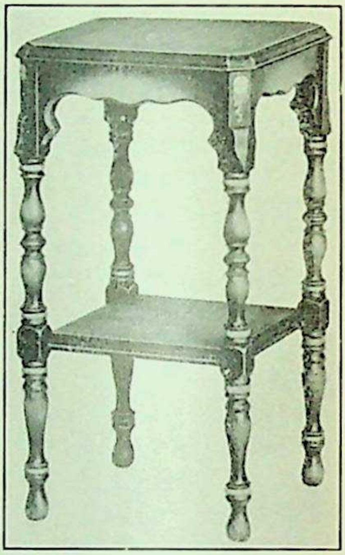


Plate II.—Method of Shading Night Table, Gum Frame and Maple Top, with Lacquer Spray-Shading Stain Over Filler.

## SPRAY SHADING

The impression to be avoided is that of a light oval, circle or square for which reason it is best to do the work in two applications, correcting any mistakes in the first after it has dried. Holding the spray on a given corner in order to compress the shading into one operation may cause the stain to puddle or blotch which must be evened up by sandpapering, a risky remedy. The same is true of results from dirty material lines or a "spitting" gun. Air pressure should run 50 to 60 pounds according to the type of equipment and must remain uniform after starting.

## WATER STAIN ON PANELS

*Walnut.*—To take a walnut cabinet or bed panel for example, the gun is held fairly close, about twelve inches away, and the spray is passed up and down, back and forth over the corners and edges, being drawn away as the centre of the panel is approached, at the same time releasing pressure on the trigger to cut down the flow of material. In this manner only the outer edges are actually stained wet—the centre area is merely "fogged" or "misted," but carefully "feathered" or graduated in tone toward the darker portion. The lighter area usually predominates; in many cases only the area immediately adjacent to the shaded frame shows dark at all.

*Formulas.*—There are a variety of water stain formulas suitable for shaded finishes on bare walnut, a few of which follow:

(1) 3½ oz. standard walnut aniline and 1/16 oz. scarlet to the gallon of water.

(2) 1½ oz. mahogany brown, ½ oz. jet nigrosene, 1/16 oz. lemon yellow to 3 gallons water.

(3) 4½ oz. walnut crystals, 3 oz. each mahogany brown and jet nigrosene, ¾ oz. sal. soda to 5 gals. hot water; let cool and add 5 gals. cold water.

(4) 1½ oz. walnut crystals, ½ oz. mahogany brown to 1 gal. water.

(5) 1½ oz. each mahogany brown and jet nigrosene to 2 gals. water and 1 pint denatured alcohol.

(6) 4 oz. standard walnut or walnut crystals and ½ oz. jet nigrosene to 1 gal. water and 1 pint alcohol.

(7) 6 oz. standard walnut, 2 oz. walnut crystals, 2 oz. jet nigrosene, 1 oz. lemon yellow to 2 gals. each water and alcohol.

*Filler.*—Where the wood is not to be left open-pored, the wood filler naturally has some effect, serving to soften the high-lighting in a degree governed by its own depth of color. It should therefore not be too dark nor be applied directly over the stain, but only after the stain has been allowed to dry and a wash coat (1 part 4 lb. cut white shellac to 7 gals. denatured alcohol) sprayed on and sanded smooth. This serves to seal the wood against any undue darkening action on the part of the oil in the filler which might otherwise obliterate the high-lighted effect entirely.

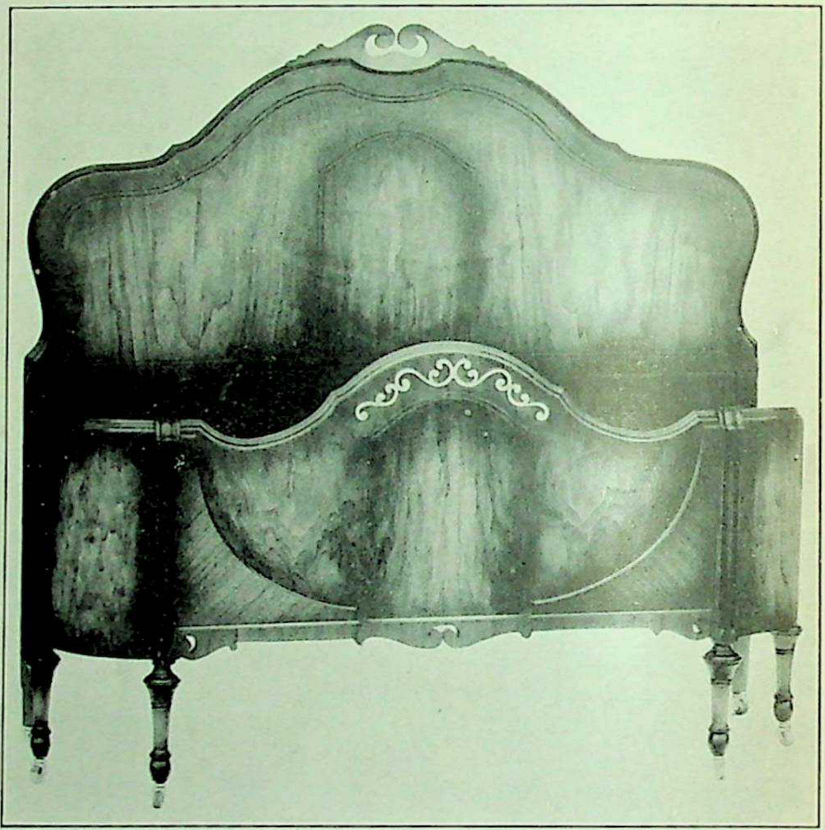


Plate III.—Walnut and Gum Bedstead, Shaded Over Filler with Spirit Shading Stain.

*Mahogany.*—In the case of a brown mahogany finish on mahogany, the problem is somewhat different due to the natural light reddish undertone of the wood itself which must first be made uniform all over. To accomplish this brown mahogany water stain of the desired shade is first mist-sprayed all over evenly, in a total strength of not over one or two ounces to the gallon of water. When this is about dry, a 4 to 6 oz. gallon solution of the same stain is spray-shaded on as indicated for the walnut process above. A red mahogany finish is customarily shaded a blackish tone and the foregoing remarks concerning filler also apply.

*Formulas.*—As with walnut it would be impossible to give for mahogany all of the stain formulas suitable for a shaded finish. Practically any of the standard Adam and Antique brown powders put out by manufacturers will serve, provided the above recommendations as to mist and shading coat strengths are adhered to. The formulas which follow are for shading only over any standard body mist coat color of light brown or reddish-brown tone:

(1) 4 oz. mahogany brown, ½ oz. jet nigrosene, to 1 gallon water and 1 quart alcohol.

(2) 6 oz. blue black nigrosene, 4 oz. orange yellow to 5 gallons water.

(3) 5 oz. mahogany brown, 1 oz. orange yellow, ½ oz. jet nigrosene to 1½ gallons water. For red mahogany the proportion of black in each formula is increased.

*Birch, Poplar and Gum.*—These are shaded and high-lighted as above outlined for walnut and mahogany according to which one is to be imitated. No filler is needed.

*Maple.*—The modern color for birdseye or blistered maple veneers ranges from a rich dark or light hazelnut brown to a mellow antique amber. These stains may be purchased ready-made to be dissolved as per manufacturers' instructions or mixed with anilines as follows:

(1) Brown—¾ oz. standard walnut, ¼ oz. mahogany brown, ⅛ oz. mahogany red to 1 gallon water.

(2) Amber—1¼ oz. each walnut crystals and scarlet, 5 oz.

each orange and lemon yellow dissolved, 1¾ oz. to 1 gallon of water. To shade add ¼ oz. jet nigrosene to the gallon solutions or use 1 oz. each bich. potash and walnut crystals to the gallon of water and apply when body color is dry.

(3) Silver Gray—For silver gray maple ¼ oz. each blue black and jet nigrosene to a gallon of water forms the base coat stain. This may be shaded by using the same solution strengthened with an additional half ounce of jet nigrosene or mahogany brown, but does not call for as pronounced a shaded effect as for the amber. Being a tight-grained wood, maple requires no filler.

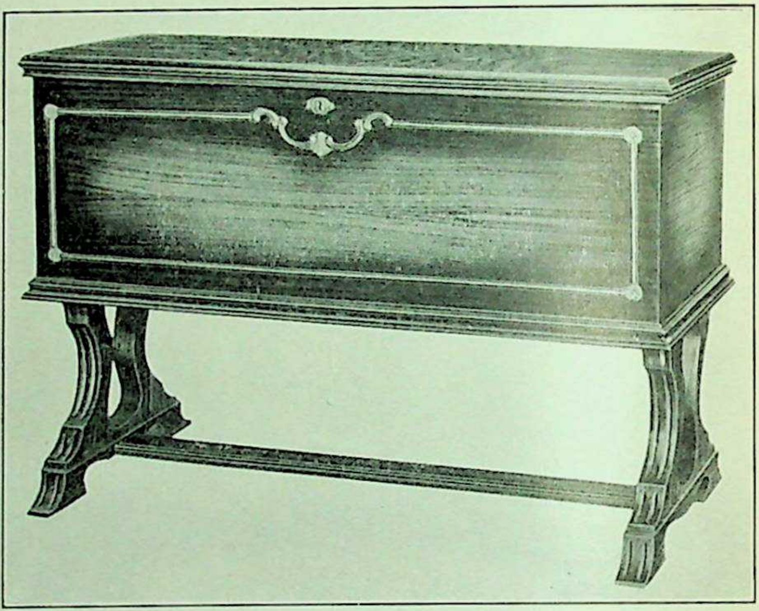


Plate IV.—Water Stain Shading Direct on Walnut Veneer.

*Satinwood.*—This is usually stained with a solution like ¾ oz. of tobacco brown and ¼ oz. lemon yellow to a gallon of water, but is sometimes shaded to harmonize with walnut with a solution of 1 oz. mahogany brown to the gallon of water. No filler is required.

*Oak and Ash.*—When a close approximation of antique originals is the idea the work is left unfilled, oil or water stain being sprayed direct as for walnut. On modern designs natural or light brown filler only is applied, followed by spirit shading stain when dry.

For other water stain formulas see Chapters VIII and IX (Book III).

### OIL STAIN SHADING ON PANELS

Oil stains are sprayed for high-light and shading purposes more often on oak than gum, birch or walnut and practically never on mahogany. Ordinarily staining and shading may be performed in one operation, but it is occasionally desirable to cut the stain in half or less with benzine for the body color, full strength for shading. For extra dark shading a small quantity of oil black aniline may be added to browns and grays. Unless to be left open-pored, filler should be applied over a shellac wash coat as for water stains. There are any number of ready-mixed oil stains on the market in all standard shades, and while not so clear or fast to light as water stains, serve satisfactorily for cheaper grades of furniture on which the sanding operation would constitute too great an expense.

### SHADING ON FRAME WORK

The frames of cabinet work are ordinarily stained the same shade as the veneers—if of birch or gum it is often necessary to make a double application in order to bring up the color or both stain and fill along with the veneer. The frame may be spray-shaded, high-lighting in the centre or wherever handling would be natural, or by narrowing the sweep of the spray here and there so as to blend light and dark sections together irregularly. A fine spray cone is essential. The more popular practice is either not to high-light at all or use sandpaper or steel wool lightly here and there after the stain is dry, or if an oil stain, wipe while still wet.

The underframing and backs of chairs and aprons of tables are shaded according to the shape, the high lights following the rule of natural wear, i. e., contact with the surface of the back, legs, elbows, feet, etc. There is no set rule for table tops—they may be treated as panels, or irregularly shaded and high-lighted without any set plan. Legs may be spray-shaded by cutting the spray down fine and showing high-lights only on raised turnings and carvings, but the work is also easily done by hand as described below.

### HIGH-LIGHTING BY WIPING OR SANDING

If no spray is available or the worn effect is to be applied to turnings, carvings, mouldings, etc., where the use of a spray is unhandy or wasteful, the stain may be dipped or brushed on full strength, high-lighting if wet by wiping, if dry with 2/0 steel wool or fine sandpaper, such as 5/0 garnet. This too requires skill but of a somewhat different sort, the high-lights appearing on all raised or bulbous parts, the shading in recesses, grooves, flutings, etc. On panels the theory is the same as for spray-shading, but equally delicate effects are much more difficult to obtain.

*Wiping.*—With oil stains this is a common practice, using a cheese cloth pad or pouch while the stain is still wet, working on sections of the piece at a time and constantly turning the outer layer of the pad or pouch so as to present a clean surface unclogged with material. The stain is brushed on in a uniform body color, easy wiping being possible in most cases for the next fifteen minutes, thereafter the cloth is best moistened with benzine. One weakness lies in the tendency of oil stains to take dark on porous spots and fail to penetrate hard ones, so that graduated "feathering" is often a problem where the wood is not of uniform texture.

*Sanding.*—With water and spirit stains the popular practice for hand high-lighting is to let them dry, then employ the abrasives above referred to, but it is also possible to wipe with a rag or pad moistened for the former with water, for the latter with alcohol. Compared to spraying this is tedious work and the danger of scratch marks showing through the finish as well as the risk of getting one part or another too light, necessitating retouching, is ever present. Nevertheless, on small objects in particular, like carvings, half round mouldings, turnings, candle sticks and similar work, a careful hand can turn out very respectable work.

### SHADING OVER FILLER, SHELLAC AND LACQUER

For some classes of furniture, alike on panels, frame work and carving, a practice has arisen which bids fair to become increasingly popular. The piece is first stained uniformly all over, usually in a rather light or only medium dark tone, then in the case of birch, gum and maple, shellac wash-coated, in the case of modern walnut or mahogany filled as well after the wash coat. If ordered out in a solid tone it is finished up in the regular way in lacquer or shellac and varnish, but if a shaded effect is specified, the piece is spray-shaded directly over the shellac or filler and then given the protective lacquer or varnish coats. Thus stock may be kept on hand to meet either kind of demand.

*Aniline Spirit.*—An ordinary water, oil or spirit stain, such as would be suitable on bare wood, will not serve—there must be some binder which will make it possible to adhere over filler, shellac, lacquer or varnish. A number of popular formulas follow:

(1) 3 oz. walnut spirit stain, ½ oz. spirit nigrosene, dissolved in 1 gallon denatured alcohol with 1 quart shellac substitute added.

(2) ⅛ oz. spirit nigrosene, ½ oz. Bismarck brown dissolved in 1 gallon denatured alcohol with 1 quart 4 lb-cut white shellac added.

(3) 1¼ oz. 127 spirit nigrosene, ¼ oz. spirit loutre brown, 3 oz. Bismarck brown dissolved in 4½ gallons denatured alcohol, with 1 gallon 4 lb.-cut white shellac added.

All may be altered to a lacquer formula by substituting clear body lacquer for the white shellac and lacquer reducer for the denatured alcohol. Lacquer formulas have less body than shellac formulas, but give a slightly more transparent tone. To give a darker effect in any of the formulas it is only necessary to increase the proportion of alcohol soluble black, which will also make it more suitable for red mahogany. A lighter effect is procured by increasing the proportion of alcohol or lacquer thinner or decreasing the aniline content.

*Pigment Oil.*—Where it is desired to shade and high-light by hand (at some sacrifice of speed), it is possible to employ a pigment shading stain consisting of equal parts burnt sienna and burnt umber in japan, mixed in solvent naphtha with a small quantity of boiled oil added for easy wiping and asphaltum varnish for depth. Such a mixture may be brushed or sprayed on and hand-wiped if desired within fifteen minutes of application. It should stand overnight to dry and may be used over water stain, hard dry filler, lacquer or shellac and under shellac, varnish or lacquer. The color may be deepened by adding a proportion of Van Dyke brown if desired.

### SELECTION OF SHADING METHOD

The question of which shading method to use is based largely on the quality of the work. For example, a cheap cabinet may be rushed out by omitting stain and filling direct on the open-pored veneer, shading on the wet filler and the bare gum parts direct with pigment (not aniline) oil stain or shading stain. This is allowed to dry overnight, followed by a shellac sealer coat, sanding and varnish. If desired a shellac spirit shading stain may be substituted for the oil stain.

Where fancy veneers are involved see method outlined in Chapter IX (Book III).

# CHAPTER II

## GLAZING AND SHADING PAINTED WORK

ANTIQUE shading on painted furniture is known also as "parchment finishing," "glazing," "misting" and "smoking," the latter two applying particularly to spray application. The purpose is either to give variety to a plain body color or soften the sharpness of a bright one, and in some cases to duplicate the effect of antique painted originals. Antique "glazing" is generally understood to imply hand work, but however applied, the material should go on the work very thin, almost watery, so it will appear transparent and reveal the paint, lacquer enamel or bronze body color showing through. The glaze or antique shading materials are also customarily applied over striping, hand-painted or transfer designs, bronze or colored flutings and vein lines—in fact, over all decorations.

### CHOICE OF MATERIALS

A pigment glaze to be shaded and high-lighted by hand may be prepared in various ways, either with Van Dyke brown and burnt umber japan colors in turpentine or by adding to equal parts turpentine and pale japan dryer any of the following combinations of dry colors; (1) nine parts Van Dyke brown and one of white lead; (2) equal parts Van Dyke brown, burnt sienna and burnt umber; (3) equal parts burnt sienna and burnt umber with a trace of lamp black. Such glaze mixtures should dry in four to six hours and be protected by a wash coat of shellac or shellac substitute before the final lacquer or varnish finish coats. The undercoat must be hard dry or the glaze will soften it, resulting in a muddy, blotched or streaked appearance.

## SPRAYING

Stain or lacquer antique shading materials to be applied by spraying only are best purchased ready-made, but may be shop-mixed for small jobs as follows: (1) *Stain*—dissolve 3 oz. Bismarck brown, 1½ oz. spirit nigrosene and ¼ oz. loutre brown in 4½ gallons denatured alcohol and add one gallon 4 lb.-cut white shellac. (2) *Lacquer*—add to one part each black and clear lacquer, two parts light brown (tan will do) and reduce with 4 parts lacquer reducer. Both mixtures will dry in an hour to coat over, but will be dry enough to handle in half the time—hence no attempt should be made to wipe or high-light by hand.

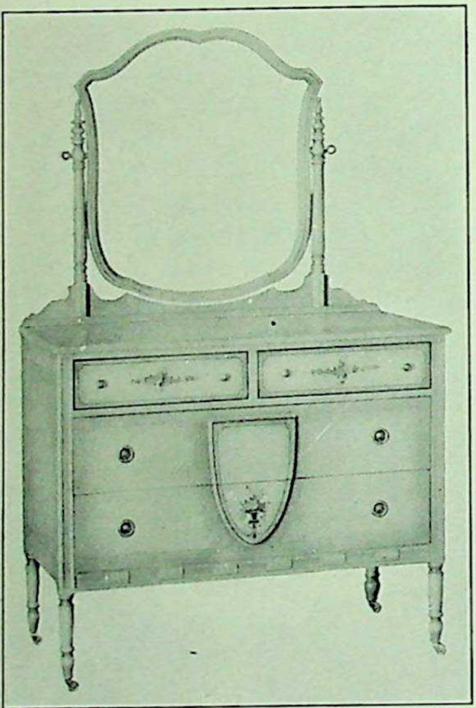


Plate V.—Enameled Dresser, Showing Spray-Shading with Lacquer Stain Followed by Rubbed Varnish.

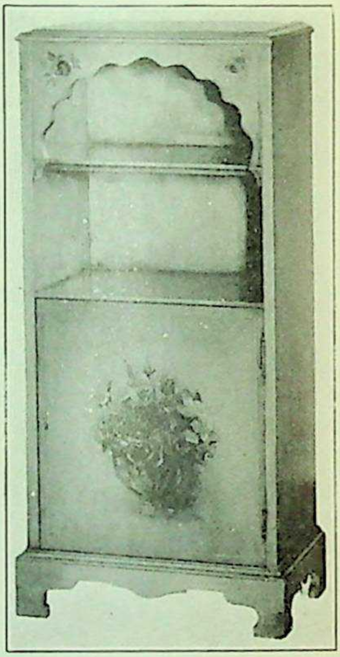


Plate VI. — Hand Antique-Glazed Painted Bookcase.

The first is for use over paint or lacquer enamel and should be given a clear shellac, lacquer or varnish protective coat; the second is for use over lacquer enamel only and may be left unprotected.

If the surface is large like a table top or bed end, or hard and smooth, as with rubbed enamel, spraying is the best method of application; if a spray is not available or the work is porous, as with paint undercoater, or the surface is small or irregular as in the case of legs, carvings, flutings, lamp bases, turnings, etc., the glaze is more easily applied by hand. If the work is both small and very smooth, an artist's spray will give very excellent results. Generally speaking, the spray, large or small, will give finer, mistier results and is probably superior for cabinet work of all kinds, but for smaller novelty objects a coarser, more "hand-painted" effect is often preferable. It is difficult with words alone to make a clear distinction—only practice with each medium can make it really plain.

## HAND WORK

By the hand method the glaze is brushed on evenly all over, allowed to approach the "setting" point, which may be a few minutes or an hour, according to the amount of japan dryer in the mixture, then wiped off the parts to appear light. If the glaze is still wet, a dry cloth will serve; if drying has advanced to a "tack," the cloth should be moistened with benzine. The glaze should never be allowed to dry hard or even reach a tack. Where hand-applied and high-lighted, the antique effect will be more pronounced where the paint surface is rough than when smooth and this should be kept in mind when the undercoat is selected and applied. For instance, a porous undercoat or one put on with a coarse brush which will dry with the brush marks visible, will catch and show more glaze than a smooth glossy paint or rubbed enamel surface.

## HIGH-LIGHTING AND BLENDING

After the glaze has been wiped the effect of "feather-edging," so easily accomplished with the spray, is usually lacking. For this reason it is necesary to go over the surface again with a light, broad badger hair brush, known as a blender, to draw the dark and light areas together in a gradual shading. On flat surfaces the principle is the same as for stain shading as to where high-lights and shadows should appear; on raised work such as carvings, mouldings, etc., it is only necessary to pass the benzine-moistened rag over the prominent parts, letting the glaze appear chiefly in the recesses.

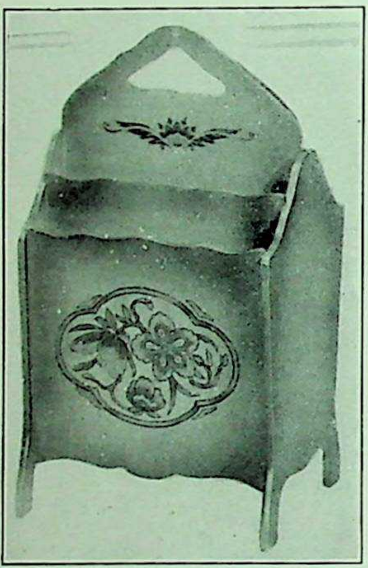


Plate VII.—Magazine Carrier, Both Finished and Shaded with Lacquer Enamel, Top Coat of Flat Lacquer.

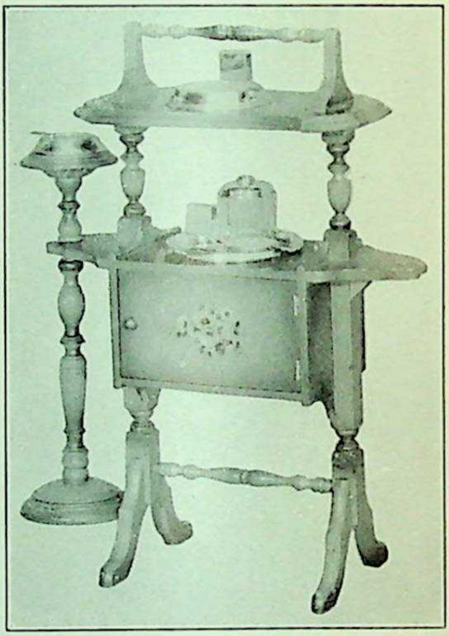


Plate VIII.—Smoking Set in Flat Paint Undercoater, Japan Color Shading, Decalcomania Floral Transfer and Flat Varnish.

## COLOR SHADING

On novelty furniture, such as tilt-top tables, magazine carriers, humidors and the like, the antiquing idea is often subordinated

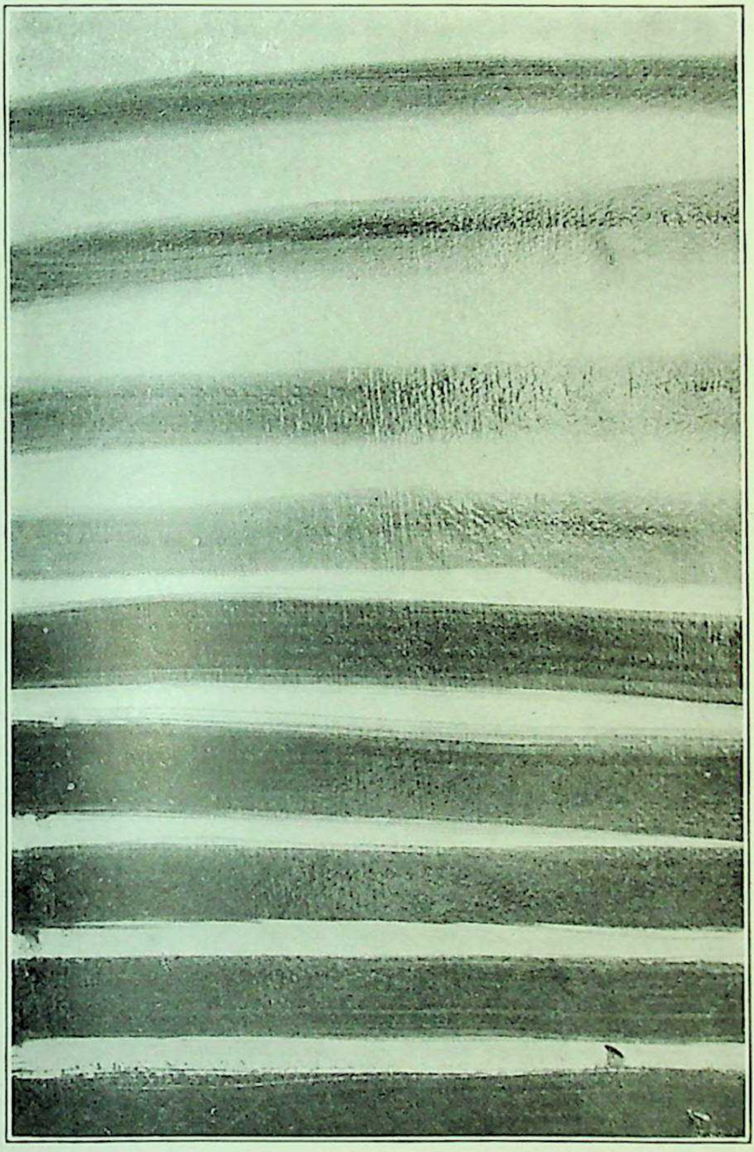


Plate IX.—Horizontal Stripes of Glazing Color for a Graduated Blend.

Plate X.—The Graduated Blend Finished.

to a desire for color harmony, in which case the shading materials are made up or procured in japan, oil or lacquer colors. For such work the spray is almost universally used, producing such combinations as dull blue or dark gray shading on a light gray body color, black on light green or red, dark blue on light blue, tan on ivory, lavender on green, gold on black, etc. Decalcomania transfers or hand painted floral groups are frequently used to supplement the decorative effect, being placed in the centre, the color shading beginning some distance away and following the edge of the surface.

Where the body color is lacquer enamel, the shading color is usually of the same type, reduced for "smoking" or "misting," one part to one part of clear lacquer and four parts of reducer, although the exact proportions will often have to be varied to suit the body of the lacquer enamel used and the hiding qualities of the particular color. If applied too heavy the shading will feel "dusted" or rough to the touch, and a clear melting coat will have to be applied, composed of seven parts reducer and one part clear lacquer.

On paint body colors japan colors may be employed, reduced to thin consistency with benzine or turpentine and reinforced with a little pale varnish to bring up the lustre if a clear final coat is not to be applied over such shading. Oil colors are not popular owing to their slowness of drying, although this may be speeded up by the addition of pale japan dryer in small quantities. Aniline spirit stains in shellac do not give the desired depth of color on the deeply shaded areas owing to their complete transparency.

Color-shading runs to far greater depth of tone than antique shading as the idea is based somewhat on a compromise between two-toning and the graduated feathering out peculiar to misting and smoking. In other words color-shading is not required to be altogether transparent except as misted, and this appears only as the centre of the surface is approached.

# CHAPTER III

## ANTIQUE DUSTING

VERY often a visit to a museum will reveal an antique piece of furniture which has been brought to light after centuries of hiding and neglect. Note how dust and dirt have collected in the carvings, crevices, pores and mouldings, giving the finish in whole or in part a decidedly grayish brown tone. To reproduce this on new stained furniture, to create the same aged effect or to soften bright colors in addition to antique glazing, as on polychrome, lamps, picture frames, etc., there are a number of different methods.

### OPEN-GRAINED WOODS

Walnut, oak, ash and elm, being open-pored, dust will catch in the open grain as well as in carvings. It is therefore possible to get the effect by filling over stain and wash coat with gray paste wood filler, but instead of wiping off the flatted filler at right angles to the grain so as to pack it flush with the surface, a diagonal stroke is used which takes out only a portion. As few early antiques were ever filled, this gives the effect of dust accumulation which occurred during the centuries of use thereafter. The filler is protected with thin coats of shellac and either flat lacquer or varnish, or waxed directly on the shellac. Mahogany came into use as a cabinet wood so late in history that it is ordinarily not antiqued in this manner.

### CARVINGS AND FLUTINGS

For a more pronounced aged effect, especially where there are carvings, flutings and mouldings, wood filler may be omitted entirely. The stain should preferably be a dull tone of brown or brownish gray, coated over with shellac if an oil stain, clear lacquer if a water stain. Over this is brushed on a coat of liquid wax, made by mixing in the clear wax a quantity of powdered rotten stone, dry sienna, umber or Van Dyke brown, or a combination of these, about twelve to sixteen ounces total to the gallon of liquid. While still wet on the work, this "antiquing slush," as it is often called, is wiped off so as to leave it sticking only in the pores, carving, beading and moulding crevices. The mixture of pigments and wax must be thorough and kept stirred to prevent settling. Moreover, the proportions must be such as to produce a pronounced grayish cast, heavy enough to form a deposit in pores and crevices but fluid enough to be easily brushed. To wipe off, a benzine moistened rag is best.

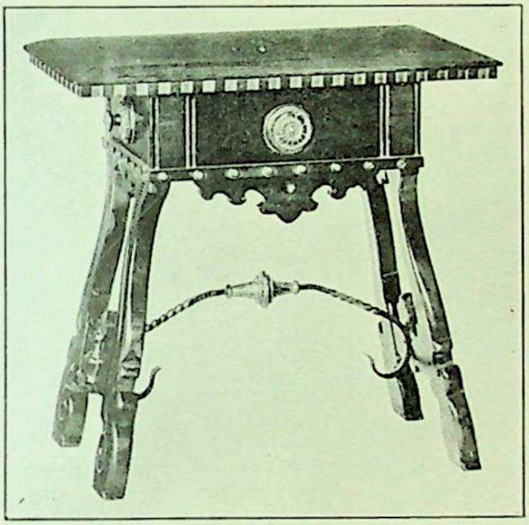


Plate XI.—Smoking Stand, Showing Antique Dusting on Rosette at Center and on Fretwork and Buttons. The Spool in the Iron Underbracing is Gold-Bronzed and Antique-Glazed, the Remainder Eggshell Black.

### CLOSE-GRAINED WOODS

Pine and chestnut were favorite woods with the ancient "joyners" and for this reason are sometimes still used for antique reproductions, such as chests and benches. Being close grained in texture, there is little to which a gray filler or pigmented wax can take hold unless the wood is purposely roughed up with coarse sandpaper. Consequently the practice is to tone either with a weathered oak oil stain or a water stain made up of about a half ounce of a jet nigrosene and a quarter ounce of tobacco brown to the gallon of water. This is then shellaced, lacquered or varnished and waxed over as above described, the slush showing chiefly in carvings and mouldings.

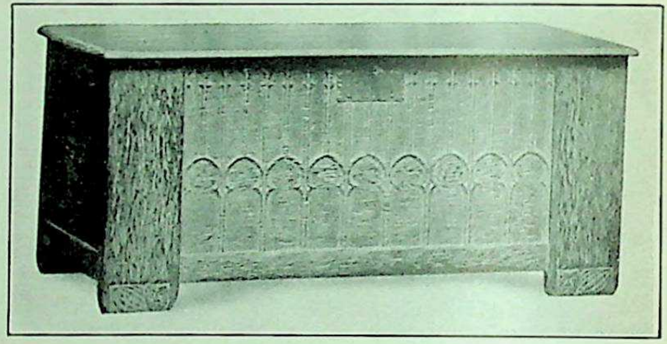


Plate XII.—Antique Reproduction Showing Use of Dusting on Oak to Produce Aged Effect.

For an extra antique appearance, pine furniture prior to the above operation may be washed with sulphuric acid. The chemical effect is to eat into all but the hard parts, causing them to stand out from the rest of the surface, a process which may be hastened by sprinkling on water and scrubbing the wood with a shoe-handle wire scratch brush. To neutralize the acid prior to any staining, wash the pine thoroughly with a dilute solution of ammonia; it may then be finished natural as above described to give a dull lustre.

## PAINTED WORK

Lamps, picture frames and the polychromed portions of stained furniture are given the pigmented wax treatment over the top finish coat, the grayish tone appearing in all depressions, usually in addition to the antique glaze to enhance the aged effect and counterbalance the brightness of the paint colors. If the paint be applied thick with a coarse brush, the resulting ridges will also catch and hold a certain proportion of the wax after the wiping has taken place. (See *Polychrome,* Chapter XI.)

# CHAPTER IV

## STIPPLE GLAZING AND VENETIAN WORK

STIPPLE glazing, known otherwise as flat stippling, because it is applied over a smooth surface, must be distinguished from raised stippling which is described elsewhere. The purpose is much the same as for antique shading, i. e., to lend variety to a plain background, to soften bright colors and to give a certain aged effect. It is somewhat easier to produce than shading in that the glaze is mottled all over the paint or lacquer enamel body color instead of being blended out here and there. Like shading it may be used for antiquing or for novelty color effects with the same glaze mixtures and color combinations as described in Chapter II for hand and spray work respectively.

### HAND STIPPLING

The working procedure calls for a stubby stiff-bristled brush or a coarse sponge cut in half and moistened with benzine. With either of these the freshly applied pigment antique or japan color glaze is tapped until the entire surface takes on a uniform mottled appearance. New patterns may be created by varying the pressure and adding to twisting motions of the hand at the same time as tapping. It is even possible to employ a whisk broom, a roll of crumpled newspaper or a similar ball of muslin, and the glaze may be brushed on thin as for shading or considerably heavier in consistency.

Everything depends on the fineness or coarseness of the pattern desired. In all cases, however, the tips of the brush should be wiped from time to time with a clean rag, the sponge wrung out at intervals in benzine, the newspaper discarded for a clean ball and the muslin rerolled in order to present that clean stippling surface which alone can insure against a smeared job. For the novice it is always best to practice first on a painted test panel until assurance is gained.

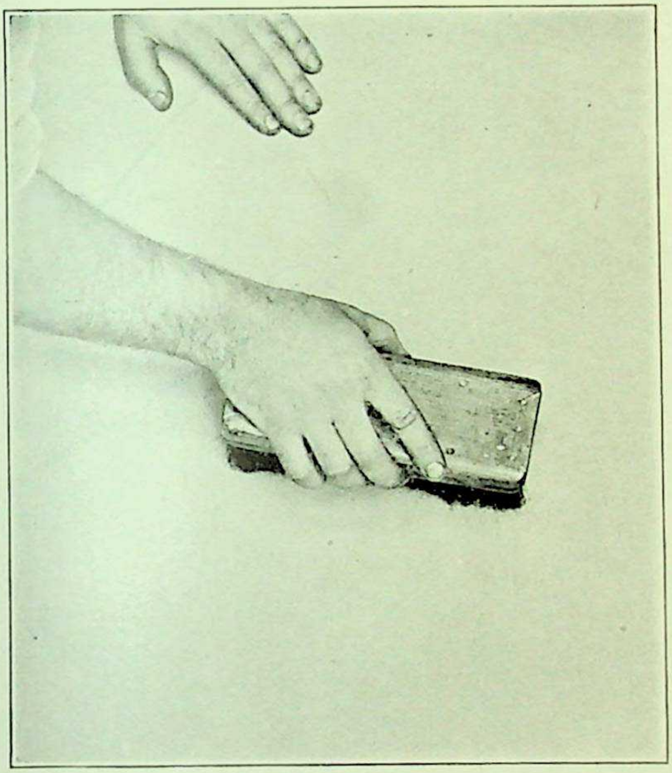


Plate XIII.—The Stippling Brush and How It Is Used.

SPRAY STIPPLING

The spray method is quite different giving rather the hazy effect of rippled clouds, in fact, it is rather like irregular shading. The glaze may be made up of oil or japan colors reduced very thin with benzine, distemper colors thinned with vinegar or lacquer enamel cut one part to three or four of reducer.

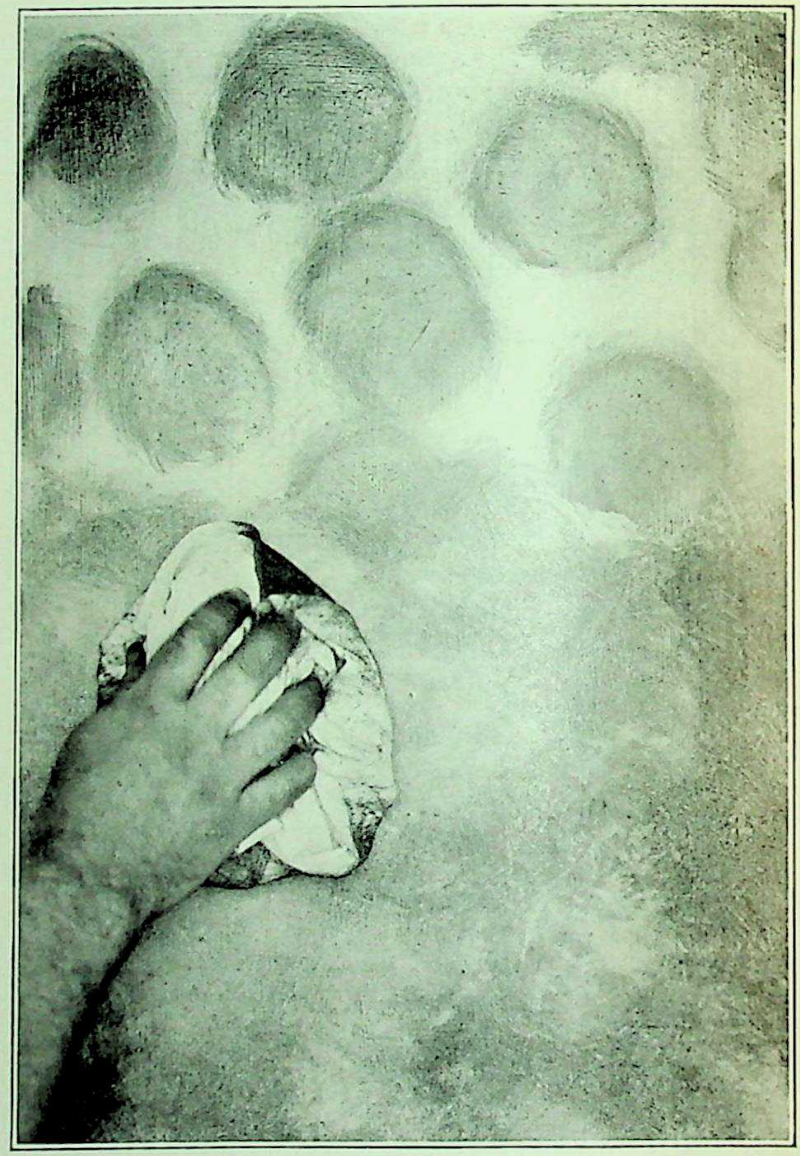


Plate XIV.—Spots of First Color and the Beginning of a Cheese-Cloth Stipple for Tiffany Glazing, Mottling and Blending.

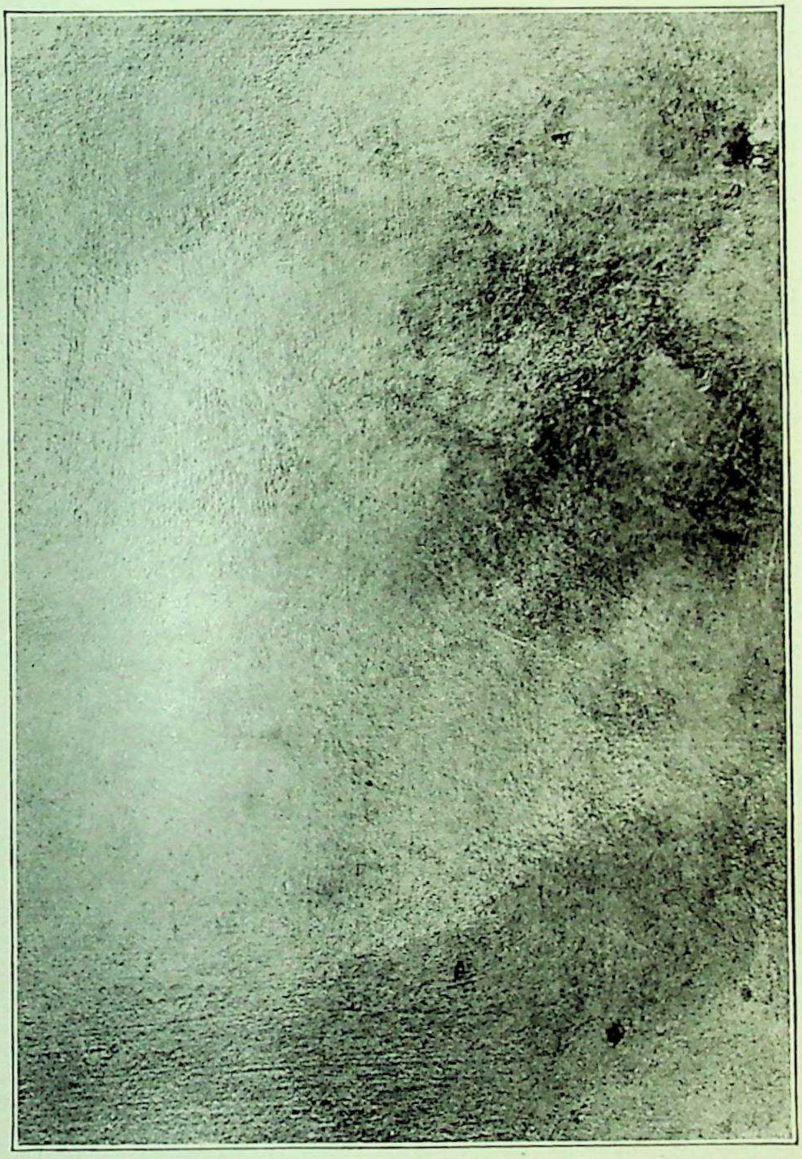


Plate XV.—Glazing Color Blended Out with a Stippling Brush.

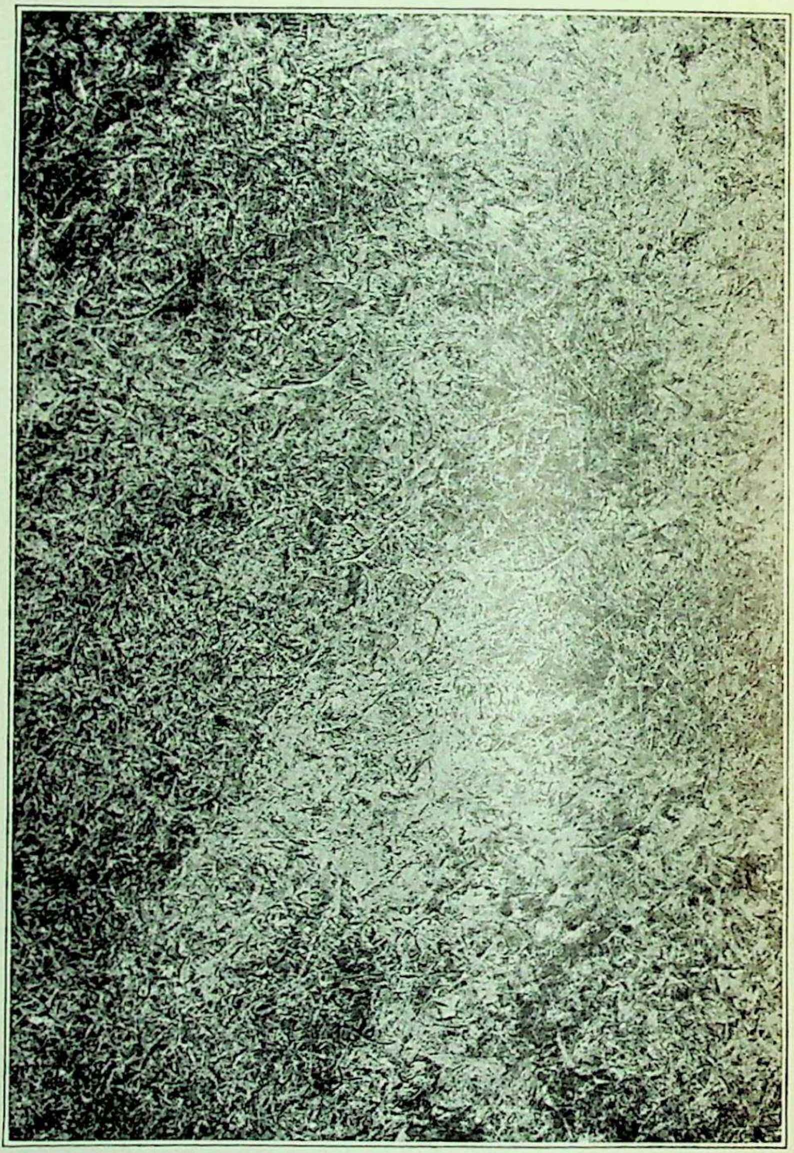


Plate XVI.—Glazing Color Stippled with a Wad of Newspaper.

Where clear lacquer is to form the protecting coat, the oil mixture is not desirable; no top coat at all is really needed over lacquer enamel or japan colors if reinforced with a little varnish or oil color hardened by the addition of pale dryer. The gun should be played up and down over the work, alternately approached and withdrawn from the work, closing and opening the trigger, so as to throw a variegated light and dark mist coat, uniform in general pattern. An artist's gun is best for very small work.

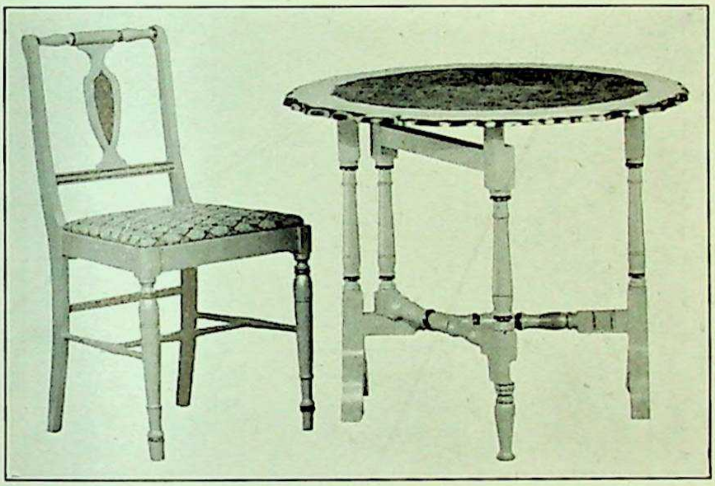


Plate XVII.—Example of Flat Stipple Glazing on Chair Back and Table Center with Harmonious Banding on Legs and Table Edge.

### WHERE USED

Stipple glazing is particularly effective on overlays or when framed by a moulding, vein line or stripe to imitate the overlay effect. A skillful color mixture and hand stippler can closely approximate birdseye maple, brown or gray. It is also used for the flat solid tops of wicker tables, for breakfast room furniture, as a background on panel fronts for hand painting and transfer decorations and on novelty pieces of all kinds. Where two or more colors are stippled over the same background, the procedure is more apt to be described as *Polychroming*, which is described in Chapter XI.

### VENETIAN WORK

This is a variety of stipple glazing which follows the manner of rococo originals produced in Venice during the eighteenth and nineteenth centuries. It is seen chiefly on expensive bedroom suites and pieces notable for their swelled, bowed or serpentine fronts and ornate design and carving. The wood is first given two coats of finely ground flat oil undercoater tinted to a light ivory or lettuce green shade, each coat being allowed at least eighteen hours to dry, then surfaced smooth with 4/0 or 5/0 sandpaper. Over the last coat is brushed a thin mixture of equal parts drop black and burnt umber in japan. While still wet, this coating is stippled by hand with a roll or wad of clean waste moistened with benzine. On borders the waste is kept dry in order to produce a darker shaded effect.

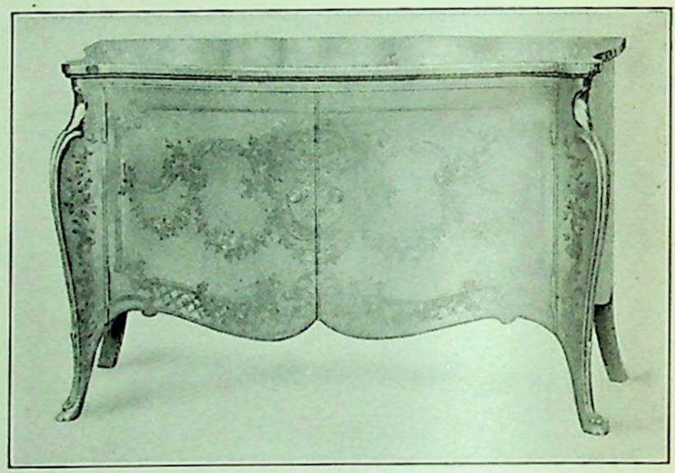


Plate XVIII.—Venetian Commode, Showing Characteristic Glazing and Hand-Painted Decorations.

The japan colors are applied with a wide camel-hair brush and are reduced with equal parts turpentine and boiled oil, the latter to prevent too quick setting. The proportions for the mixture are about two teaspoonfuls of the combined japan colors as taken from the containers to a quart of the turpentine and oil.

When hard dry, two coats of white shellac are applied, sanded and followed by two coats of pale varnish rubbed to an eggshell lustre or a coat of pale coach varnish and one of flat for cheaper work. Usually floral hand painting is applied to drawer fronts and bed panels with plain or fancy striping of green, brown or gold japan color around the borders, all applied over the flat ground coat and just prior to the japan color glaze stipple coat.

With lacquer the work may be done entirely by spray using lacquer pigment first coater, lacquer enamel, the glaze clouded rather than stippled, decorated and protected over all by two coats of clear lacquer rubbed or one coat gloss body lacquer and one of flat lacquer. However, lacquer is largely a production finish and Venetian reproductions are turned out mostly in limited quantities.

# CHAPTER V

## TWO-TONING

WHERE furniture is finished in two different colors or two tones of the same color it may be said to be two-toned. Although strictly speaking the term might also be applied to color shading, stipple glazing, banding, crackling, frosting, etc., it has acquired a special application as described hereafter. The effect may be simple or elaborate and is employed on all grades of furniture from the cheapest to the most expensive.

### STAIN

In the case of an oak, mahogany, walnut, gum or birch cabinet for instance, the panels will usually be a light shade, the frame work, knobs, overlays, etc., a darker shade. The effect may be procured by applying oil or water stain full strength on the latter, cut half or more on the former. Or the piece may be water stained a light shade all over, followed when dry by a wash coat of shellac applied to the panels only. The piece is then filled all over, with the result that the filler coloring and oils deepen the tone of the unshellaced frame work, but leave the protected panels light.

Again the shellac wash coat may be applied to the bare wood of the panels, the frame stained and the entire piece filled with similar results. Still again the entire piece may be stained, with a second application of stain on the frame only. The shellac wash coat system is valuable in keeping stains of different strengths from showing a ragged boundary by bleeding into one another. The color contrast may be as little or as great as desired; on cheaper work the dark effect is produced with semi-transparent black shellac, contrasted with lighter parts stained in regular walnut or mahogany tones.

### THE BOUNDARY

On oak and walnut the boundary line is often routed out in straight lines with a routing machine varied sometimes by a diamond or scroll pattern to give the effect of overlays. The depression may be lined with drop black, raw umber or chrome yellow in japan, or jet nigrosene in shellac, also gold, apple green or magenta bronze color to heighten the contrast. (See *Vein Lining*, Chapter X.) If desired a bead or moulding, stained and high-lighted or painted green or brown and antique glazed, may be substituted to serve the same dividing purpose. With

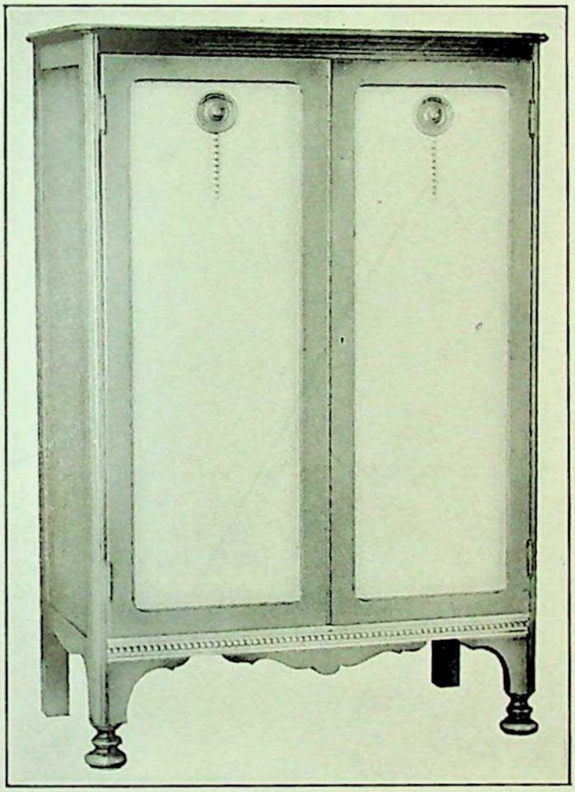


**Plate XIX.—Two-Tone Enamel, Green and Amber, with Shading and Half-Round Moulding Decoration.**

mahogany and walnut different types of veneers provide a two-, three-, four- or even five-toned effect, all left natural or carefully stained so as to make the contrast appear rather in the figure of the wood than in jumbled coloring. (See *Matched Veneers*, Chapter IX.)

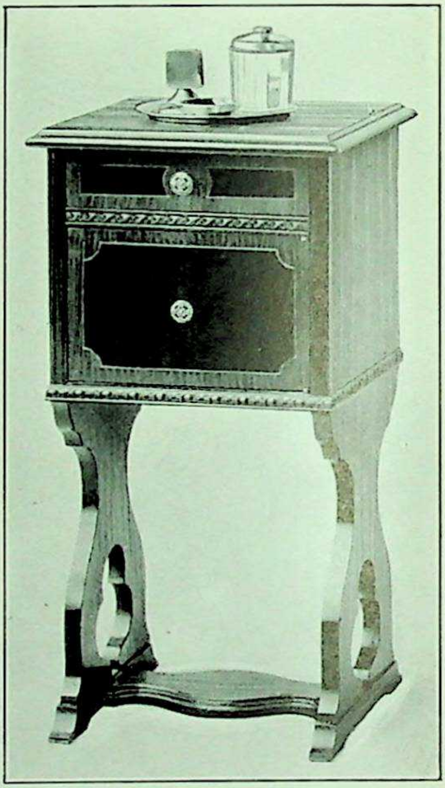


Plate XX.—Two-Tone Walnut Humidor with Gold-Bronzed Vein Lines.

### PAINT OR LACQUER ENAMEL

On painted furniture, notably breakfast room suites, radio cabinets, odd living room pieces and the like, the body color is built up all over, whereupon a given portion is masked off with heavy manila or oiled paper held taut at the edges with iron weights. A contrasting shade is then sprayed on so as to show only on the outer edge or centre portion, the legs banded to match. A band of gold bronze or paint stripe of a third color may be run wherever the two contrasting shades meet, although this is not essential, if the division is clean, except for additional decorative effect. Stain may be combined with paint as where a table top is stained dark gray and an outer band sprayed on in red, blue or black enamel. Favorite two-tone color combinations are Chinese red and black with gold bronze dividing stripe, ivory and blue striped dark blue, gray and rich blue, gray and pink, white and blue, light green and lavender, black and gold, etc. A shaded mist or stippled glaze coat of a third shade on the border or in the center sometimes lends additional novelty interest.

# CHAPTER VI

## CARVINGS AND MOULDINGS

IN THIS day of mass production and popular prices genuine hand carving on furniture is a rarity. When met with we should keep in mind the injunction not to attempt gilding the lily or painting the rose. Like these two flowers, fine hand carving is beautiful enough in itself to require no further embellishment; at most for an antique effect we may high-light the stain by sanding or steel wooling lightly when dry. Great care should be taken to pick out with a shoe-handle stiff bristle brush all filler and pumice stone slush or it will show up white and unsightly upon drying. Carvings of open grained woods like oak, walnut or mahogany are not easy to fill with paste wood filler; extra coats of shellac or french polish are usually relied upon to level up the pores.

### VARIETIES

Most of the carving seen on modern furniture is made by machine, sometimes pressed from real wood or pulp but often moulded from a composition of sawdust and glue or rosin, whiting and boiled linseed oil and japan dryer. The former especially, where they show the wood grain, may be stained along with the rest of the piece, but the latter and more brittle varieties will not take a stain and must be painted and decorated. Water stain would soften the glue and oil stains turn dark; if necessary to procure a stain effect, shellac lightly and tone with spirit stain of desired shade mixed in shellac. Ormolu imitations are obtained by painting in solid with gold bronze, pale or Roman, mixed with varnish bronzing liquid.

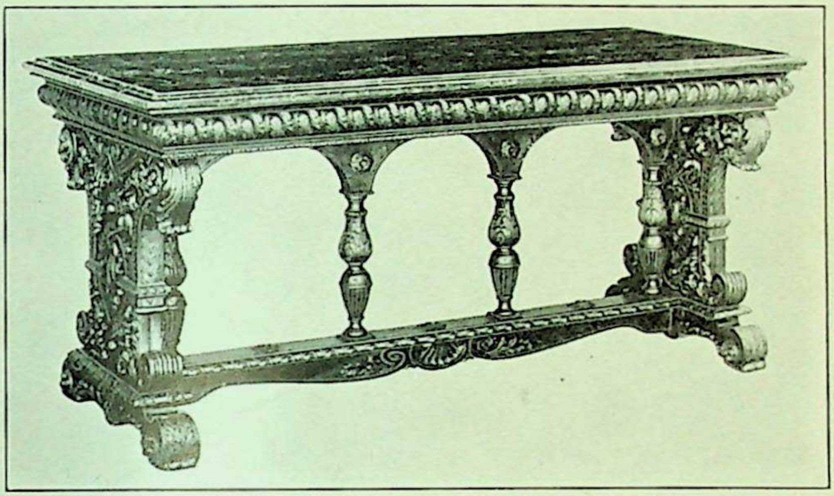


Plate XXI.—Hand-Carved Walnut Renaissance Table, with Marble Top, Carving Water Stained and French Polished.

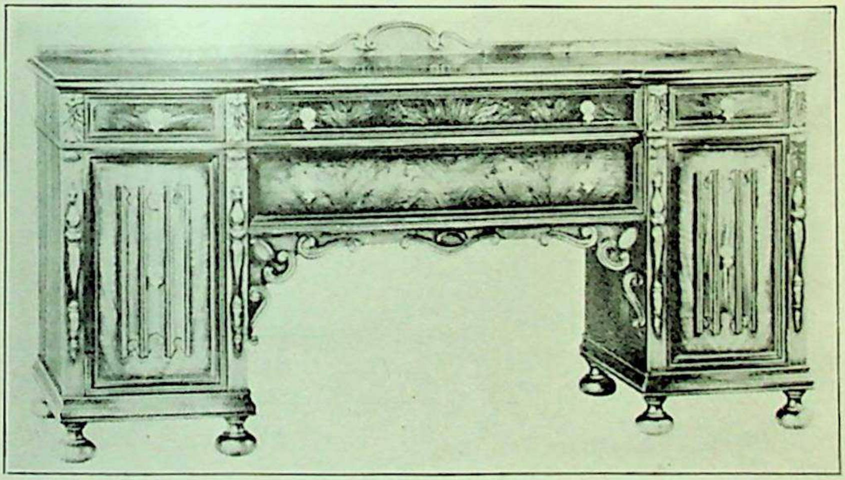


Plate XXII.—Buffet, Showing Crotch Mahogany Veneers, Extensive Carving and Half-Round Mouldings.

## COLORING

Applied carvings are apt to be of relatively small dimensions, baskets, wreaths, floral groups, vases and urns for panel centers, garlands and rosettes for post and aprons. Where stained with the piece they may be antique shaded, high-lighted and dusted, but frequently they are picked out in color over the shellac coat. A rosette for instance may be colored in with an artist's brush and japan color, green, red or both, wiped over with gold bronze, as for polychroming or painted with gold bronze mixed with dry burnt umber and varnish for a plainer aged effect; a relief

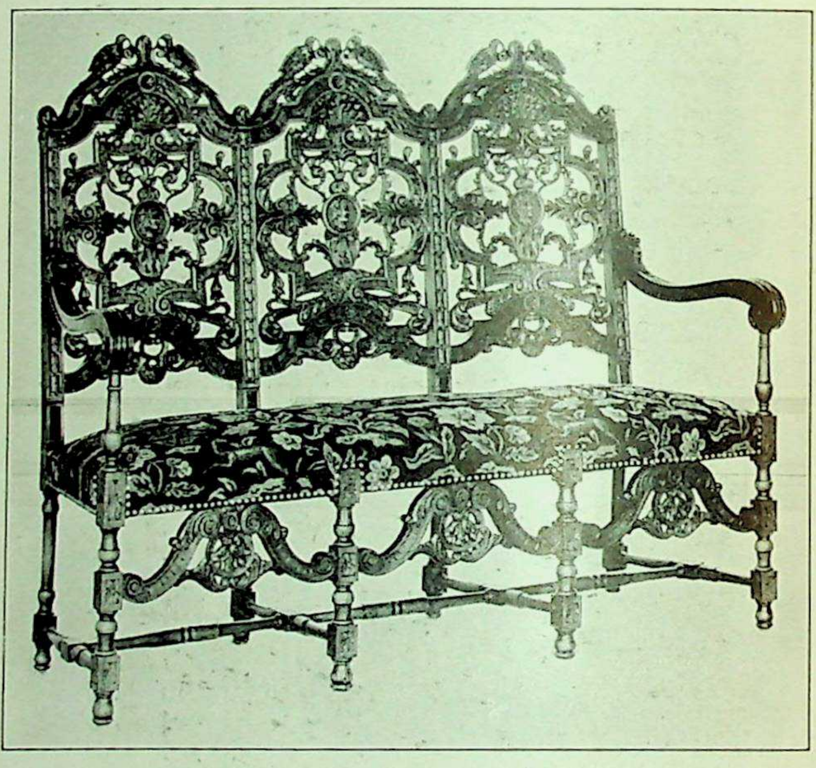


Plate XXIII.—Example of Hand-Carved Seat, Water Stained and French Polished.

moulding may be left in body stain color or painted, then coated with gold bronze, wiped off while wet and antique glazed, or it

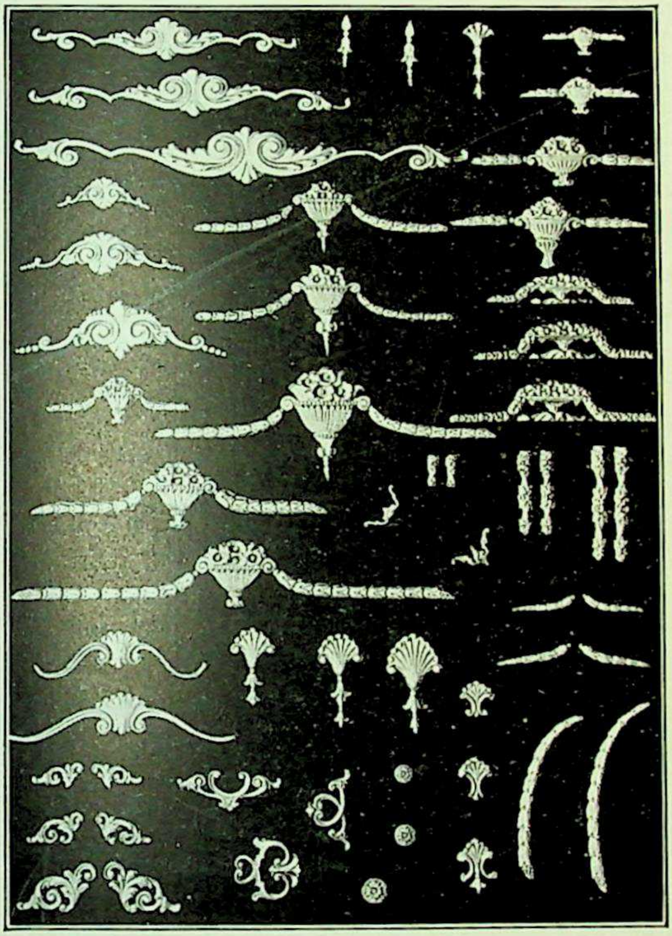


Plate XXIV.—Examples of Composition Furniture Mouldings in Various Patterns.

may be ebonized with black shellac to separate a two-tone effect. In fact, the variety of coloring is limited only by the amount of hand work the cost of the piece will stand.

Half-round and border mouldings are usually simply highlighted on raised parts by hand sanding after the stain is dry.

Imitation metallic effects on wood carvings, as for hinges, Spanish plaques and the like, are obtained in various ways. The

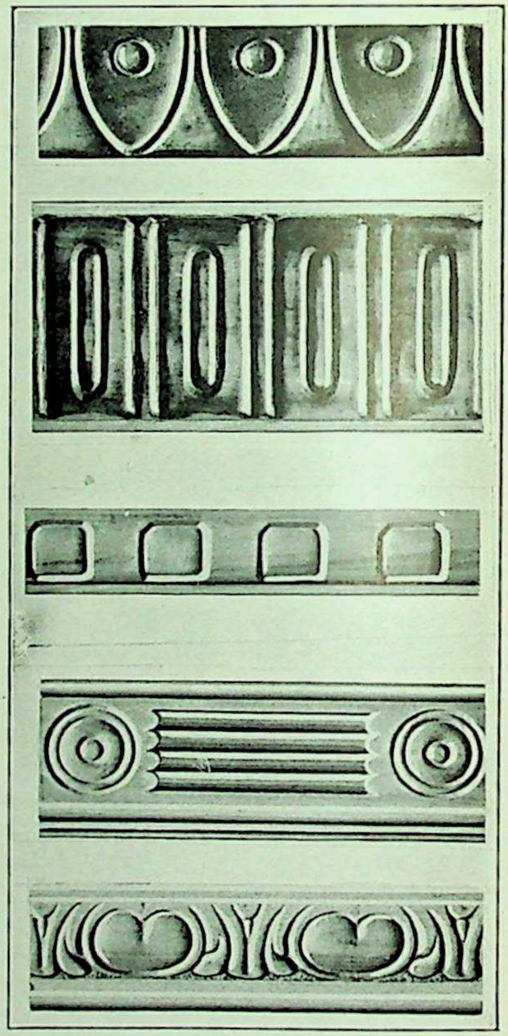


Plate XXV.—Examples of Good Quality Composition Carving to be Applied on Flat Surfaces for Staining or Painting.

wood may be stained an orange yellow with a weak solution of water soluble anilines and then varnished over, or simply given a coat of orange shellac and varnished, a natural filler being used if the wood is open grained. The varnish is not rubbed but frequently antique glazed by hand. A hammered gold effect is obtained by applying stippling paste of heavy brushing consistency. (See also Chapter XV and XX.) This is stippled to a rough surface then allowed to dry and painted with pale gold bronze in varnish; when dry burnt umber in japan reduced with turpentine is stippled on by hand in a fine pattern to give the illusion of hammered indentations. The whole is protected with clear lacquer. It is also possible to apply a coat of dry burnt umber mixed with gold bronze in varnish bronzing liquid to get a metallic effect.

# CHAPTER VII

## INLAY AND MARQUETRY

INLAY is a process whereby strips of rare wood are set into veneered tops and fronts, these being first sawed out for straight lines and machine routed or hand gouged for curved patterns so as to permit the inlay to lie flush with the surface.

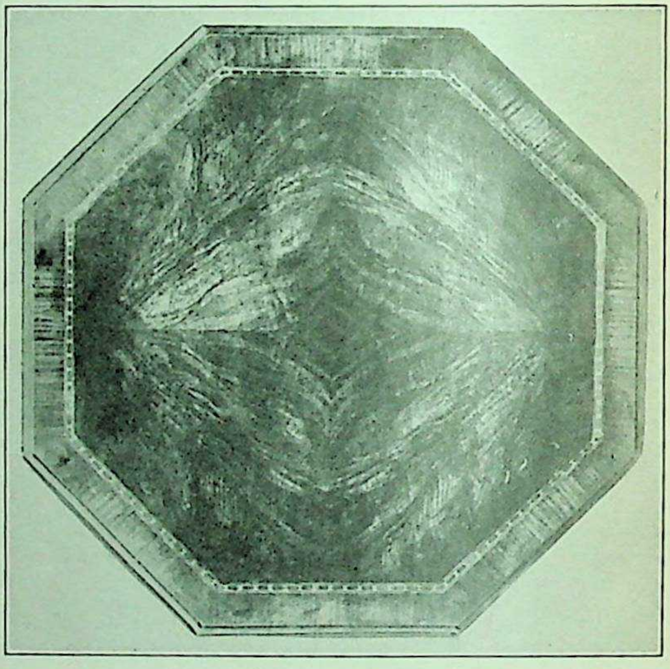


**Plate XXVI.—Border Inlay on Four-Way Mitred Butt Walnut Octagonal Table Top.**

The depression is first cleaned, then lined with glue, and as soon as snugly fitted in, the inlay is clamped tight; when the glue is dry any surplus is washed off and the inlay is sanded smooth with the rest of the surface.

A typical inlay strip is generally from one-eighth to one-half inch in width, spaced at a suitable distance from the edge of the table top, cabinet panel, drawer front, etc., but may run as high as two, three or four inches in width. Again inlay may be used to form a geometrical pattern, a star, a sunburst or a checkerboard effect, using a lighter wood against a darker background or vice versa. Favorite woods for the purpose include alone or in combination, white holly, ebony, white mahogany or prima vera, zebra wood, rosewood, tulipwood, boxwood, etc.

All have a distinctive figure or coloring of their own, and being tight-grained for the most part as well, require neither staining nor filling. They are therefore given a thin coat of white shellac before the rest of the piece is touched and so are protected, the shellac and subsequent lacquer or pale varnish finish bringing out the natural beauty of these woods to the full. Ebony may be imitated by running two scratch or vein lines spaced as given above for the widths of inlay, then staining between with jet nigrosene water or spirit stain in a strength of not less than six ounces to the gallon and using black filler if the wood is open-pored like mahogany or walnut. Thus, although there is no actual inlaying, the appearance of it is closely approximated, and if desired, the scratch lines may be lined with gold bronze to heighten the effect. Enamel inlay may be imitated by filling the groove with white lead-varnish putty tinted to pastel shades with oil or japan colors.

Plate XXVII.—Pollard Oak Sunburst Veneer Table Top, Showing Marquetry Inlay.

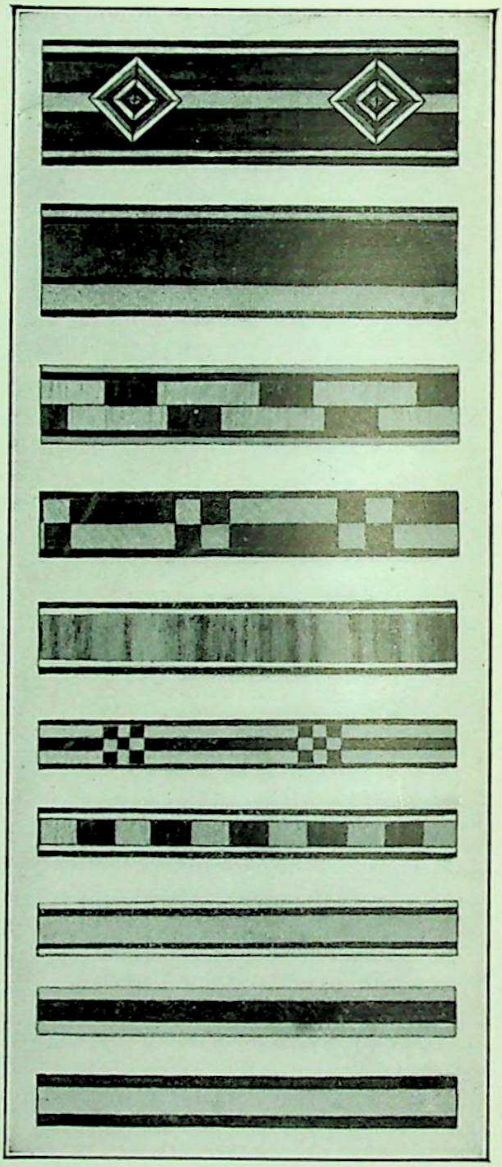


Plate XXVIII.—Sections of Inlay, Showing Typical Border Designs.

## MARQUETRY

Marquetry is a variety of inlay distinctive in that two or more different woods, selected according to color and grain, are cut, pieced together and glued to a paper background so as to form a given pattern. This may be an arabesque, a conventionalized basket, floral or urn design or constitute an elaborate picture, reproduced from an oil painting. It is an ancient art widely practiced during the Italian Renaissance, when it was known as *intarsia,* and among the Dutch of the same period, who discovered many of the woods now used, and in the period of Louis XIV.

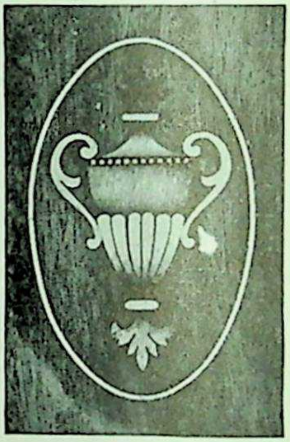


Plate XXIX.—Conventional Inlay Pattern.

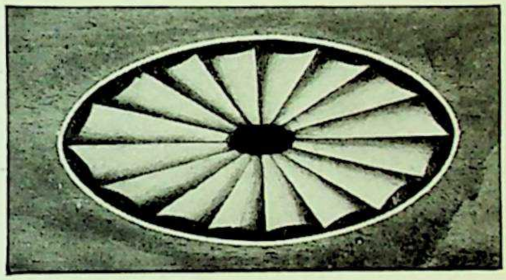


Plate XXX.—Conventional Marquetry Inlay Pattern.

Marquetry designs come in oval, circular and rectangular patterns set in an equally thin veneer of mahogany, walnut or satinwood and often framed in strips of contrasting hue. Many of the pieces making up the picture are extremely minute in size, and in order to obtain the desired lights and shades, a vast number of woods are employed since few are artificially stained, but actually grow in the particular coloring. The design is trimmed down to the edge of the frame and traced on the surface of the panel which is chiseled or gouged out and coated with glue to receive it snugly. When the blocks and clamps are removed, any paper coating is washed off, after which it is sanded to uniform smoothness and finished natural.

Imitation marquetry, or perhaps rather marquetry effects, are obtainable in various ways. One is to sandblast over a metal stencil plate in such a way that the design appears on the bare wood in roughened form; then when the stain is applied the color shows slightly darker in the pattern than on the remainder of the surface. The process may be reversed whereby all of the panel but the design is sandblasted. Again the marquetry may be closely imitated by decalcomania transfers or by spraying lacquer or japan color through a stencil plate, using pastel shades in each case, and touching up by hand when dry. Finally a special bleaching lacquer may be procured and sprayed on the bare wood through a template or metal stencil; the color of the stain and filler coats next applied will not "take" over the pattern produced by the lacquer, leaving it light against a background of dark, or vice versa, as desired.

An excellent example of this effect is shown in Plate LI, page 312.

# CHAPTER VIII

## OVERLAYS, FRETS AND GRILLES

WHERE inlay and marquetry are set into the veneer so as to lie flush with it, an overlay, as the name would indicate, is set upon it and so raised above it. Stained overlays consist of selected hardwoods of choice figure such as crotch and fiddle back mahogany, curly, blister or birdseye maple, pencil stripe, stump and burl walnut, redwood burl, satinwood, sycamore or Mexican cedar. They are built up with plywood to various thicknesses, sometimes set in a lighter or darker moulded frame of geometrical or broken curve shape stained a harmonizing color. A recessed overlay, which might be termed "underlay," is produced by cutting out the center of the panel, framing the edge and placing the overlay at the back.

The question of staining the overlay veneer itself depends on its natural figure and coloring, for while it must harmonize with the general tone of the piece, it should also contrast sufficiently in one or the other respect to attract attention. Thus some may be stained, filled, shellaced, shaded and high-lighted separately from the rest of the piece, as with walnuts and mahoganies, or filled without staining; others like satinwood, redwood, burl and rosewood may be shellaced natural, as with inlay and marquetry. Excellent imitations of certain overlay woods are procurable in all shapes with decalcomania transfers or by the *Block Graining* method, described in Book V, Chapter IX.

Overlay veneers, such as burl walnut and sycamore, are obtainable already boiled in dye, so that when stained along with the rest of the piece they have absorbed all the color possible and any further stain application will readily wipe off. California redwood burl is often given a rich brown color to blend with walnut by staining with a half ounce each of lemon yellow and black aniline to a gallon of water, then shellac followed by antique shading, (See Chapter I, *Shading Over Shellac*). Rosewood is filled with medium walnut filler, shellaced and shaded as described for redwood, an extra percentage of alcohol being added to the shading stain as the wood is very oily.

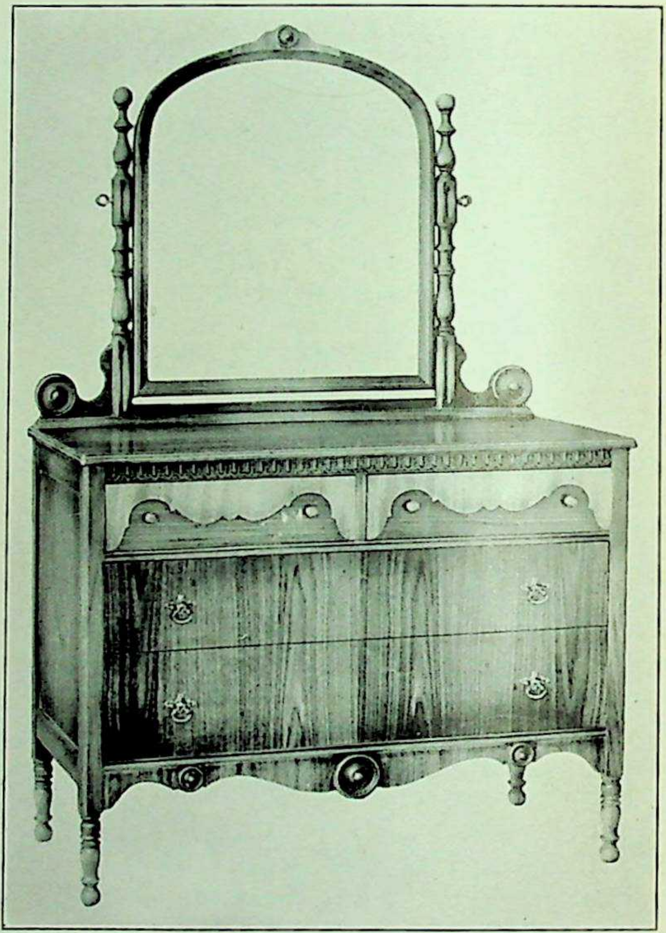


**Plate XXXI.—Scroll Mahogany Overlay on Walnut Background, Shaded.**

On stained furniture, but perhaps more appropriately on painted furniture, it is possible to have overlays of floral decorated enamel, flat and raised stipple work, crackle and oriental lacquer effects, but most of these call for the keenest kind of artistic eye or they will be hopelessly out of place. A popular inexpensive overlay effect is afforded by running a scratch line design, staining the center lighter or darker than the surrounding area and coloring the vein with pigment or metallic bronze color, or even filling in the area with an harmonious shade of paint or lacquer enamel.

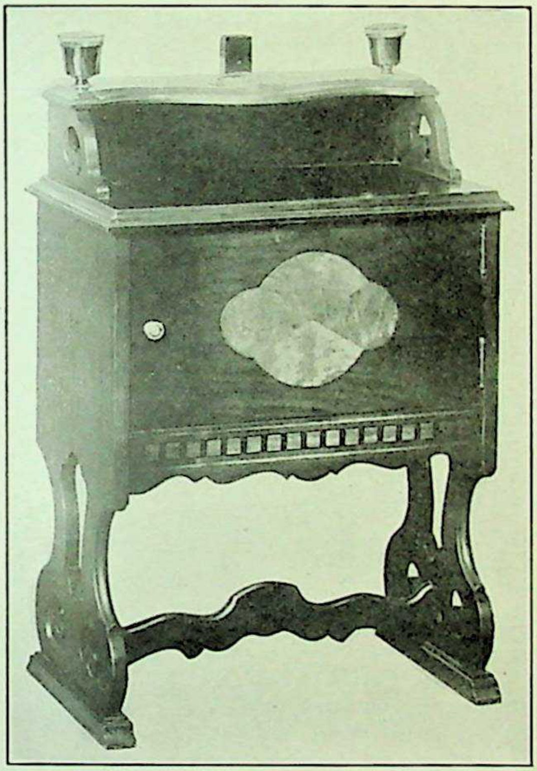


Plate XXXII.—Satinwood Overlay on Walnut Humidor with Inlaid Band Below to Match.

## FRETS AND GRILLES

Frets represent a lattice work style of overlay, glued to an otherwise plain surface to break it up. When set in an open frame, as with chair backs, radio and phonograph fronts, they are known as grilles. The terms are in practice interchangeable; for instance when band sawed and cemented to the glass fronts of china cabinets, they are referred to as either frets or grilles.

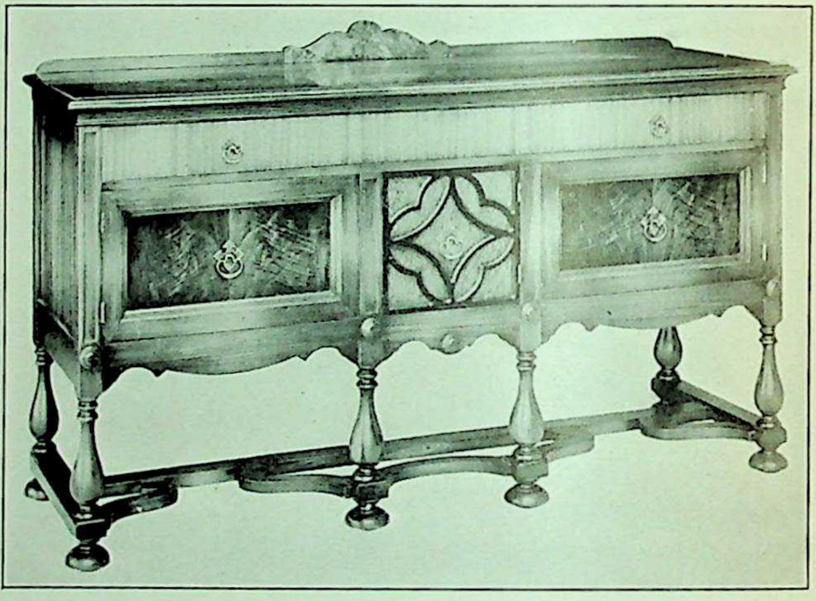


**Plate XXXIII.—Walnut and Mahogany Sideboard Showing Ebony Overlay on Center Panel of Blister Maple.**

Both are economical in cost and highly decorative in character when placed on the right type of design. An example would be their use on Spanish designs to imitate in wood the curiously wrought metal hinges and plaques of Renaissance originals.

As with inlay and marquetry the design is first scratched on the surface, but unlike the former, frets are applied directly over the pattern so produced, standing out a sixteenth to an eighth of an inch. Another difference is that frets should be applied ready finished and over a finished surface—hence great care must be exercised so that surplus glue does not ooze out and spoil the ground. Grilles are customarily finished in the same color as the remainder of the piece, but frets may be stained or painted a lighter or darker color to produce a two-tone contrast.

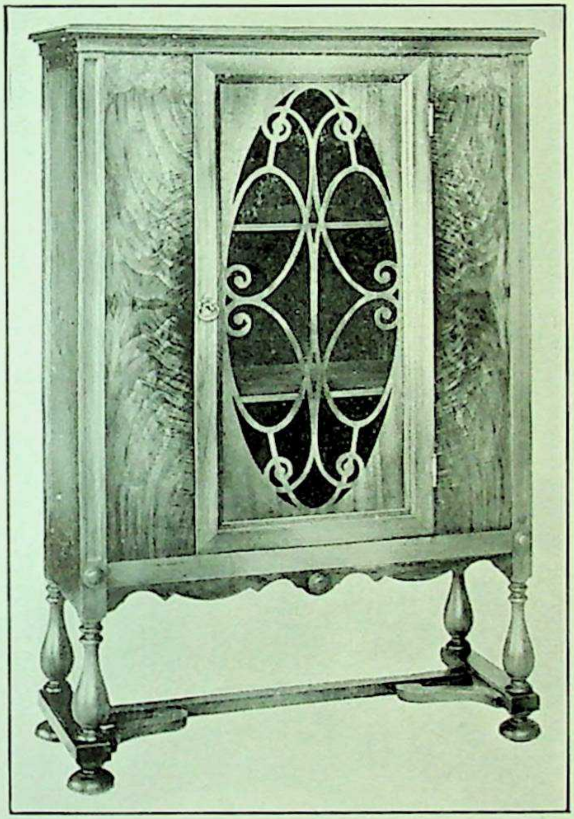


Plate XXXIV.—Walnut China Closet, Showing Shaded Grille at Center.

Both may be high-lighted and shaded if desired; when painted they are customarily antique glazed. When stained a straight color, frets and grilles may have the stain applied by dipping, then set on or in the piece when dry.

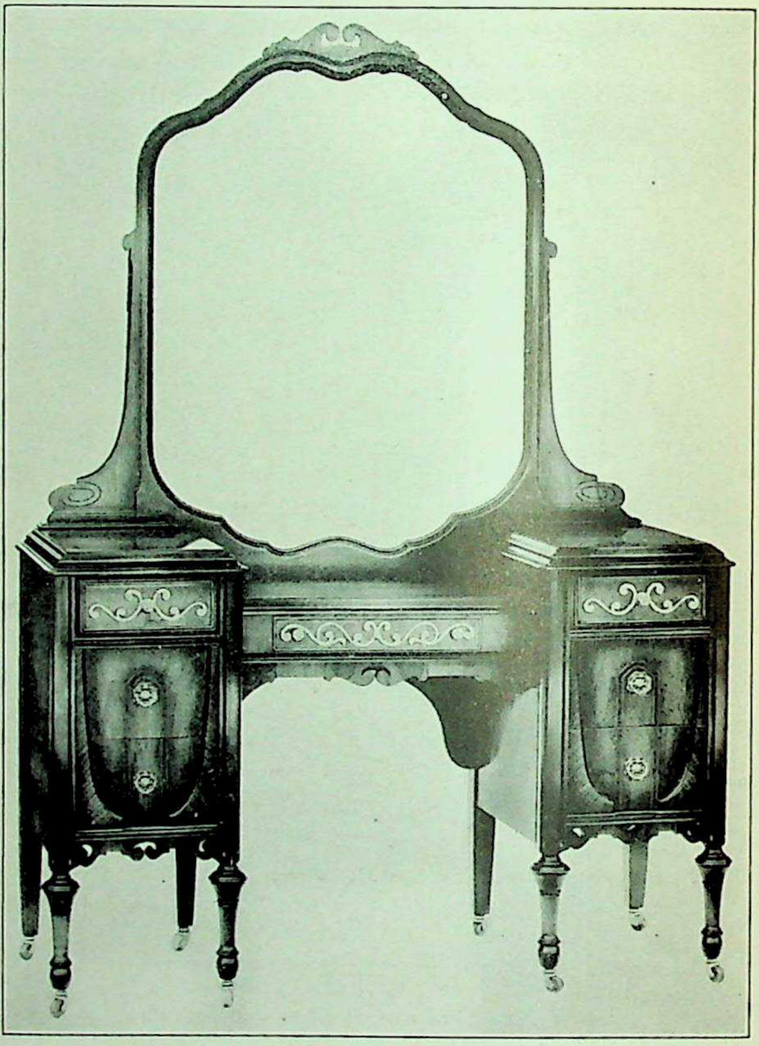


Plate XXXV.—Shaded Vanity Case, Showing Scroll Fretwork on Drawer Fronts.

# CHAPTER IX

## MATCHED VENEERS

MORE than half the cabinet work produced today depends for its chief decorative interest on the use of so-called fancy veneers—burl, pencil stripe and stump walnut, crotch, pencil stripe and fiddle back mahogany, curly, blister or birdseye maple, satinwood, rosewood, ebony, ash and sycamore to mention only a part. They are used on surfaces as small as a drawer front and as large as the rounded headboard of a bedstead. The finer the figure the more carefully must the veneer be laid or the pattern will be broken up by cross rails, uprights and corner blocks. On surfaces too large for a single veneer pattern the veneer is cut in two or in four quarters so as to match the figure of one exactly in the other without noticeable variation.

### TOUCHING UP

In cases where the cabinet room cannot or has not done an A1 job, it is necessary for the finisher to do a little touching up. Sap or other light streaks in walnut have to be toned up by hand with a brush coat of a weak walnut crystal water solution before the regular stain coat is applied, conforming to the prevailing tone of the veneer coat. Or a toner of a one-half ounce gallon solution of lemon yellow water stain may have to be sprayed over a burl walnut veneer to make it lighter or take out any murkiness in the natural coloring. The regular stain coat is applied over these as soon as it is dry. Similarly a one-half ounce solution of aniline green may be employed to neutralize any excessive redness in the veneer, as where a straight brown is desired or a walnut color on mahogany wood is aimed at.

Again nature may have left out some of the markings on one quarter of a butt joint stripe veneer or segment of a sunburst effect which must be put in by hand with a pencil striper in order to match it up with the other quarters or segments. A double strength stain, carefully matched up to the natural markings, is applied after the regular staining and quickly blended out with a badger hair blender. Water stains are preferable to oil or spirit stains and can be blended out if the work is done quickly; if dry use fine steel wool. Color defects of any kind noted after filling and shellacing have to be glazed with spirit stains of proper shade mixed in thin shellac.

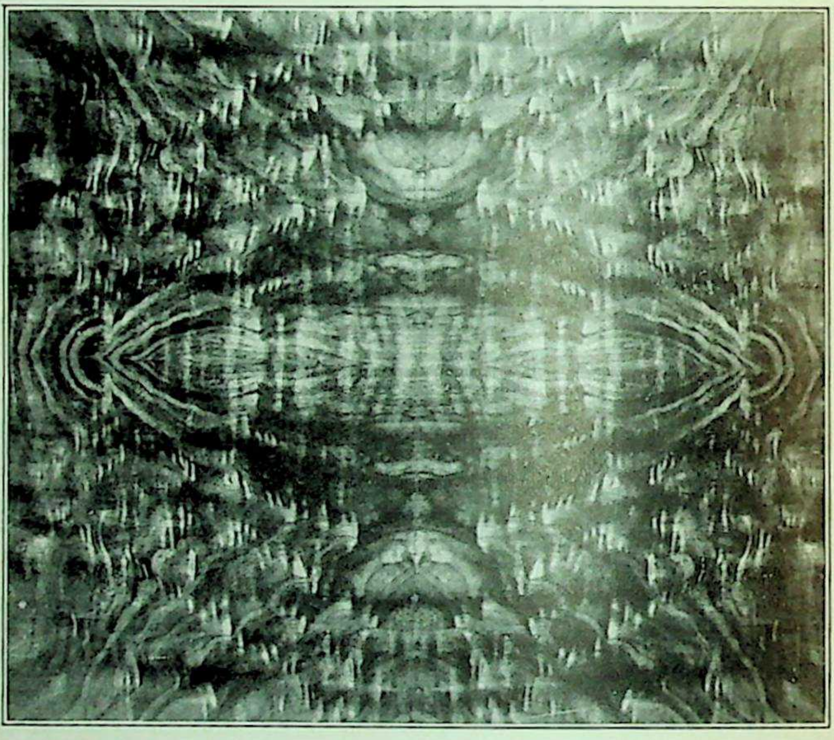


Plate XXXVI.—Four-Way Matched Walnut Burl Veneer.

### TO AVOID GREENING

Where varnish is used the lights and shades of fine veneers may be marred by "greening." This misfortune may be caused by dark varnishes, black filler, orange shellac, excessive or bronzed water stain, glue in veneer pores or insufficient veneer sanding. Lacquer applied before filler is hard dry may turn it gray in the pores—the remedy for all this is obvious. Veneers should never be stained too dark or the contrast between the markings will be lost. To insure a clear toned effect from the start, all veneers, plain or figured, should be sized with a mixture of one pint liquid vegetable glue to three gallons of water, sponged on the bare wood, sanded when dry to cut off the stiffened fibres clean. This also makes the filler easier to wipe off, avoiding thereby the smudge, which is one of the chief causes of greening.

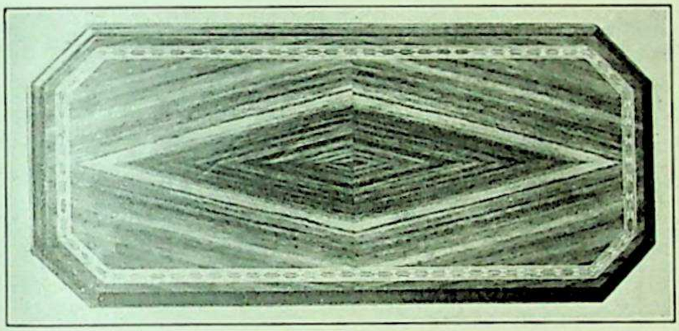


Plate XXXVII.—Matched Diamond Rosewood Table Top, Showing Two-Way Veneer.

### BLEACHING AND TONING PRIOR TO STAINING

If veneers are to be finished very light, as with French walnut, and they are not sufficiently light in themselves or contain dark discolorations, it is necessary to bleach them. There are a number of chemicals available for the purpose, most of which are objectionable for one reason or another. Oxalic acid on yellow wood turns red and when sanded is dangerous to inhale. Picric acid gives a fine yellow undertone, but is explosive and should never be kept on hand stronger than a ten per cent water solution and then only in a small quantity corked in a glass bottle. Sulphate of iron in a weak solution modifies the depth of the veneer color, but is only a mild bleach. Other chemicals used, all of which serve a uniforming but only slightly bleaching purpose are potassium-carbonate (salts of tartar), carbonate of soda (soda ash), copperas (sulphate of iron). Bichromate of potash imparts a brownish tone, chromate of potash a yellow tone, lye a fiery tone on mahogany, all in weak water solutions.

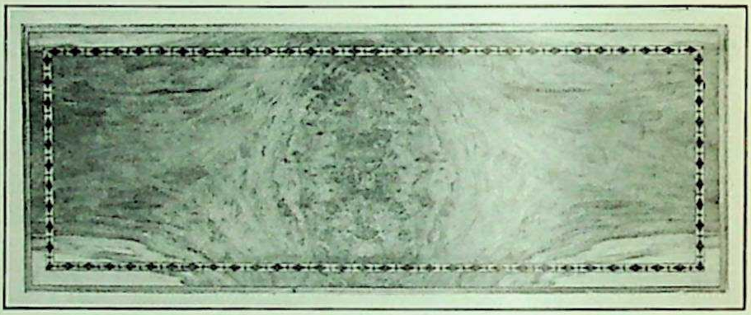


Plate XXXVIII.—Inlaid Table Top of Two-Way Butt Walnut Veneer.

The most effective bleacher, and one free from all of the above objections, as well as simple and handy to use, is sodium bisulphite which may be obtained from any wholesale drug or chemical supply house. It is mixed in a saturated solution, that is, all is put into the water which will dissolve. After settling, the clear top portion, free from residue, is poured off into another container and applied exactly as a water stain, except that the water need not be hot in mixing. When dry the surface is sanded smooth and thoroughly dusted. Water, oil or spirit stain may be applied after the dusting and the finish applied in the regular way.

Where gum parts are to be toned to harmonize with veneers of another coloring, the gum is first treated all over with weak solutions of various anilines, an ounce to the gallon of water or less. Walnut crystals are favored for such work on ordinary walnut furniture. On cheaper or darker work filling the gum with the same material as is used on the veneers will serve the purpose, wash-coating the gum first with shellac or the oil will darken it unduly.

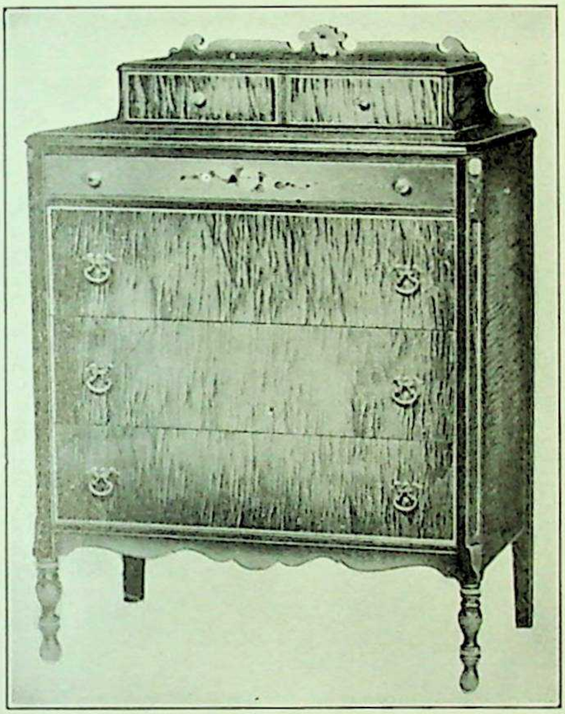


**Plate XXXIX.—Highboy, Showing Shaded Blister Maple Veneer and Hand-Painted Decoration.**

## STAIN COLORS FOR FANCY VENEERS

The question of how to treat harmoniously three or more veneers on a single piece is a constantly recurring one. While the possible combinations are without limit, let us take as a sample problem a dresser with a frame of gum, top and two large drawers of butt walnut with fancy satinwood overlay equally divided on the center, upper small drawers of maple with square veneer between of mahogany. Suggested aniline water stain formulas for each veneer follow:

*Maple.*—To 4½ gallons water add ¼ oz. mahogany brown, 13 oz. walnut crystals, 5 oz. chromate of potash.

*Satinwood.*—1 oz. each lemon yellow and orange yellow, ⅛ oz. jet nigrosene crystals to 5 gallons water.

*Mahogany.*—3 oz. each walnut crystals and bichromate of potash, ½ oz. lye, ⅛ oz. mahogany brown to 2 gallons water.

*Walnut and Gum.*—4 oz. standard walnut brown, 1 oz. mahogany brown to 3 gallons water and 2½ of alcohol.

Stain and sand all but walnut and gum first, then give each two thin coats of white shellac; now stain walnut and gum; wash coat walnut and repeat stain on gum if necessary to bring up color to that of veneer, then fill veneer with dark brown paste wood filler to bring out pores. Any over spray on gum or walnut will readily wipe off the fancy veneers due to their having been protected with shellac. Apply medium coat white shellac to gum and filled walnut, then sand and shade using a large spray cone on walnut and gum, a very fine one around edges of fancy veneers. To mix *shading stain* dissolve 3 oz. Bismarck brown, 1¼ oz. spirit nigrosene and ¼ oz. spirit loutre brown in 4½ gallons alcohol, to which add 1 gallon 4 lb.-cut white shellac.

## OTHER STAIN FORMULAS

An excellent color for *Ash* consists of 4 oz. walnut crystals and 1 oz. lemon yellow to the gallon of water. *Tulip* is a delicate wood which should be wash-coated natural with half white and half orange shellac or stained ¼ oz. walnut crystals and a trace of orange yellow to the gallon. *Zebrawood* may be finished natural or stained to imitate rosewood with a weak brown mahogany stain. *Mahogany* depends on the figure, for *fiddle back* or *straight grain* a good formula is ½ oz. mahogany brown, 8 oz. walnut crystals, 1 oz. orange yellow to 6 gallons water; for *crotch,* 1 oz. lemon yellow, 4 oz. orange yellow, ¾ oz. jet nigrosene crystals to 1½ gallons water or a natural finish by wash-coating with a mixture of 1 part white shellac and 3 parts alcohol; *broken stripe* 3 oz. walnut crystals, 3 oz. bichromate of potash, ½ oz. lye, ⅛ oz. mahogany brown in 2 gallons water. Black transparent wood filler is used with all of the above over a washcoat of half orange and white shellac, and all may be shaded with the mixture above mentioned. *Brazil Rosewood* may be stained with 2 oz. mahogany brown, 2 oz. bichromate of potash, 1 oz. jet nigrosene in 1½ gallon of water. *Satinwood*—1 oz. lemon yellow, 4 oz. orange yellow and ⅛ oz. jet nigrosene in 5½ gallons water. *Maple, blistered,* 3 oz. walnut crystals, 3 oz. bichromate of potash, ½ oz. lye, ½ oz. mahogany brown in 2 gallons water; *birdseye,* shellac half and half orange and white. All but rosewood may be shaded.

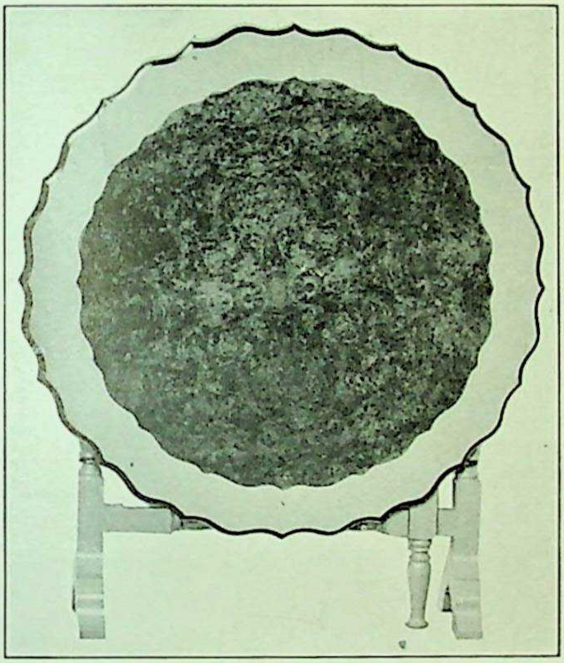


**Plate XL.—Block Roller Graining to Imitate California Redwood Burl on Table Center.**

## STAIN ON VENEER

It must always be remembered that a stain on veneer takes lighter than on solid wood which may be evened by making the veneer stain stronger or cutting the solid wood stain. To prevent a water stain from darkening unduly, as with cross grain, moisten the veneer with water first which will prevent the stain from penetrating too deeply. Filler is sometimes blamed for a streaked veneer finish when the actual fault lies in the checking of the veneer itself. A magnifying glass is the best means of analyzing veneer finish troubles. No successful method has thus far been developed for preventing the raising of the grain by water stain and it is therefore best to avoid experiments in this direction lest they end by proving costly.

## PRINTED VENEER

With the perfection of artificial mechanical graining it has become possible to print almost any veneer marking, mahogany, walnut or oak, on a cheaper wood. For instance, a poplar chest top may be stained or filled a walnut color and over it a butt walnut impression inked on which blends so perfectly with the poplar markings as to defy detection by any but an expert. The process is the same as that described for air drying in Book V, Chapter IX, *Block Graining*, and of course is best suited to large production.

# CHAPTER X

## BANDING, STRIPING AND VEIN LINING

BANDING, as the name would indicate, consists in running a swathe or band of color around the vertical edge of table top or chair seat, or along the front edges of a pier bookcase or hanging book shelf. In such a case its width is naturally delimited and to that extent requires less skill than the running of a narrow free hand stripe. It may also be applied around the legs of a chair, stool, table, couch or cabinet, free hand if the leg be of regular proportions, or set if confined to a turning or a series of turnings.

Banding may have for its object the effect of a stripe or that of two-toning according to whether it is narrow or wide. It may be applied to painted furniture or to walnut or satinwood furniture; in the latter case it is apt to be a soft shade of green or blue. A camelhair brush of necessary width and a steady hand are the chief requirements of a successful job; the same materials are required as for striping. It belongs to the simpler designs of furniture and is undoubtedly the least costly of all decorative effects to obtain.

### STRIPING AND LINING

Striping is one of the most effective means of giving decorative interest to an otherwise plainly finished surface, and while most often used over paint or enamel, is occasionally applied to natural wood finishes as well. It is not an art to be acquired overnight, yet even an amateur can turn out very passable work with patience, perseverance and practice. The principle lies in holding the handle of the brush with the thumb and first two fingers of the right hand, so placing the last two fingers that the straight-edge or edge of the wood near which the line of color is being painted, will act as an undeviating guide. The brush is pulled along by the strength of the upper arm, the even stripe of color appearing magically under the dragging bristles.

Lining consists of running a stripe between scratched or inked guide lines instead of entirely free hand.

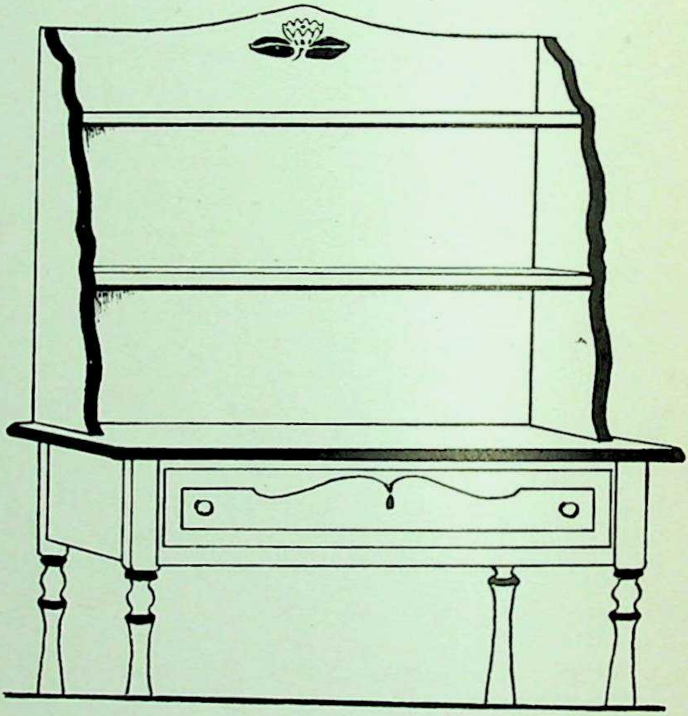


Plate XLI.—Server From a Breakfast Suite, Painted Light Green, Striped, Banded and Decorated with One Color Black Stencil of Small Conventional Design.

### PIGMENTS AND BRONZES

Of materials there is a considerable choice. On lacquered surfaces, brushing lacquer enamel and thinner, or spraying lacquer enamels with special striping reducer, may be used. Over paint or varnish, japan or oil colors are most desirable.

Japan color dries in four or five hours and to a flat lustre and should be reduced with turpentine; if not to be protected, a little rubbing varnish should be added. Oil color dries to a gloss overnight, rather too slowly for production conditions; it may be speeded up by the addition of a little japan gold size and like japan color, should be reduced with turpentine. A gold leaf stripe may be laid over japan gold size by running the stripe by brush with the latter then running over while tacky with a roller which unwinds a strip of the leaf.

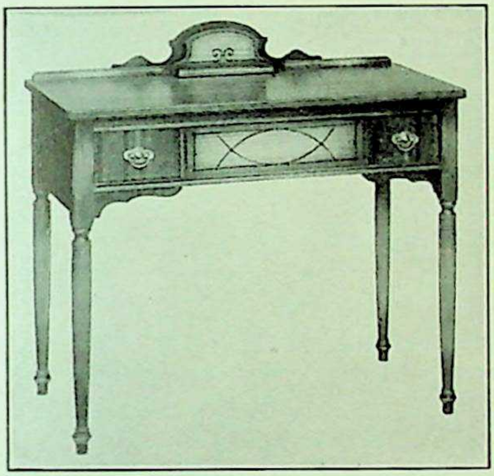


Plate XLII.—Example of Fancy Striping over Shaded Satinwood Panels.

With the exception of those mixed in lacquer, no striping materials should be left uncoated if any degree of wear is expected. Where lacquer stripes are finished over, care should be taken on fronts at least not to spray on the clear lacquer too heavily or the stripe will be softened and sag. Lacquer may be sprayed over japan color stripes, but is not advisable even over hard dry oil color, due to its strong solvent action on oil base materials.

Gold or aluminum bronzes are mixed for striping by pouring the powder into a small quantity of lacquer or varnish bronzing liquid, then thinning to striping consistency, mixing only enough for immediate work. Selection of bronzing liquid should depend on whether the surface is painted, varnished or lacquered. Japan gold size is the best all around liquid as it does not dry too quickly, and unlike lacquer or "banana oil," has no softening action on paint or varnish. With respect to proper "striping consistency," any of the above pigment colors or bronzes applied too thin will stripe out easily but fail to hide and perhaps spread; when applied too thick they will hide but drag under the brush. Similar results follow with too little or too much material in the brush. It is well to experiment first, for on the work a stripe should be run in one motion; it is next to impossible to patch, lap or trim up without leaving a telltale trace. The brush is first dipped into the material, then worked out on a piece of plate glass where the consistency can be thinned or thickened. Lacquer striping, however, requires two brushes, one kept in a can of reducer to soften up while the other is in use.

## BRUSHES

Brushes for striping are made special and should be selected with care. The quill striping pencil is best for wide stripes and lining—five-eighths of an inch and up; sword stripers are superior for hair line and stripes running up to a quarter inch. With the latter the width is regulated not so much by the size of the brush as by the pressure exerted through the operator's fingers, light for hair line, heavier for wider stripes. The bristles used in stripers are very soft—ox, camel or black sable hair, and run in length from a half inch to two and a half inches. The longer the hair the more material it will hold and thus the longer the stripe that can be run in one motion. Brushes used in Japan or oil color should be washed out in turpentine, dried, dipped in lard oil and laid away to be washed again in turps when next needed. Those used in lacquer should be washed out in lacquer reducer.

### COLORS

Next to skill in laying off the stripe and proper mixing of materials comes selection of color combinations. Walnut is best striped with apple green, satinwood with blue or green, silver gray oak with rich blue; ivory enamel with pale green, deep blue or brown, gray with pink, blue, black or aluminum; green with black, lavender or vermilion; Chinese red with black, deep blue or gold; black with gold, aluminum or vermilion; deep cream with brown, pale blue, jade green or dull red. Two stripes may in special instances be run on the same piece, as for instance a quarter inch between two hair lines, but in general one is enough, especially if antique glazing and hand painted or transfer effects are used in connection.

### VEIN OR SCRATCH LINING

On veneered fronts a stripe is apt to stand out too boldly and the range of sufficiently harmonious colors is limited. As a consequence the proposed line of the stripe is frequently routed out in the cabinet room, usually to a depth of a sixteenth of an inch, the same or double in width. This is stained and filled along with the rest of the piece, the surplus filler being cleaned out by running a pointed pick along the line then cleaning off with a stiff bristle shoe-handle brush. Any loose fibres still remaining are fixed by the regular shellac or lacquer sealing coat and readily sand off thus assuring the necessary clean groove. The vein line color should always be applied over this sealer coat—never directly over stain or filler.

### PUTTING IN THE COLOR

With the same type of brush described for striping, or with a slender, pointed artist's brush, the shallow groove is lined with the color. It is also possible to use a small oil can such as is used for bicycles and small lubrication work, flat and oval, rather than round and tapering. This is filled with the lining color, the flow being controlled by placing the thumb over a hole punched near the neck. A sewing machine can may also be used, or for very small tracings an eye dropper, but both require closer attention as the flow is not so readily controlled.

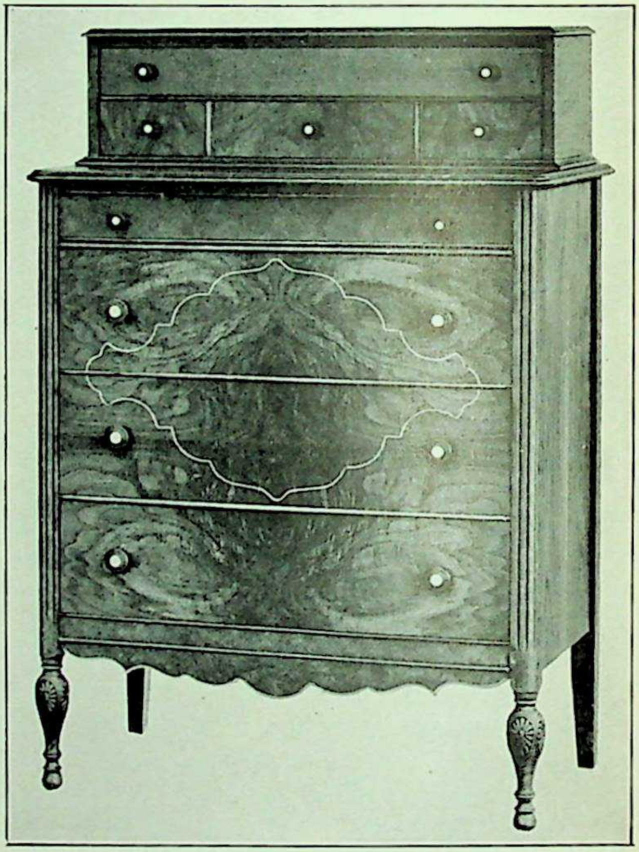


Plate XLIII.—Vein Lining.

## BRONZE COLORS

In order to enrich plain veneers on cheaper furniture the scratch or vein line is often colored with fine lining bronzes. The choice, however, is not confined to ordinary gold but includes a variety of metallic effects—peacock blue, apple green, magenta red, etc. Aluminum powder is not popular, due to its lack of color and tendency to tarnish, and some colored bronzes fade quickly when exposed to strong light. As a mixing liquid for all bronzes, varnish or japan gold size is preferred to lacquer bronzing liquids, because the former are easier to work with, wipe off clean from edges with a benzine moistened rag and have no solvent effect on the shellac sealer coat. Japan gold size, a pale grade of japan drier, is quicker-drying than varnish though not so quick-drying as lacquer bronzing liquid.

### PIGMENT COLORS

On better grade furniture vein lining is done with pastel shades in pigment colors—soft blues, greens and ivories prepared from japan colors thinned with turpentine and fortified with a little varnish. An ebony line is produced with drop black in japan and a natural effect, frequent in two-tone work, is simply finished like the rest of the piece, the vein line being coated with shellac to prevent spread of the stain.

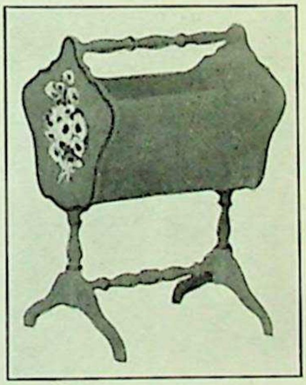


Plate XLIV.—Black Lining on Yellow Crackle with Floral Decoration at Center.

# CHAPTER XI

## POLYCHROME

POLYCHROME, as generally understood for furniture, originated in the sixteenth century with the Italian Renaissance period. The modern revival reached its peak shortly after the war when it was profusely applied to moulded, beaded and fluted carving—all raised ornamentation in fact. There is still a demand for polychrome, but confined to smaller objects—candle sticks, plaques, lamp bases, book ends, cigarette boxes, picture frames and novelty furniture. Today the methods used depend on whether the polychroming is to be applied to carved ornamentation, to stippled surfaces or to flat surfaces.

### CARVED BASE

An example of the first case would be a moulding of egg and dart design running around the edge of a table, either of carved wood, pressed fibre or plastic "gesso." The first coat acts as a sealer and consists of shellac or a neutral colored primer such as yellow ochre in japan. Next comes gold bronze, either fine lining powder in bronzing liquid or gold leaf laid over japan gold size, and finally colors in japan, the latter wiped off while still wet so as to reveal the gold on the high lights, burnished in the case of gold bronze to show sharper glints on edges or in the center. The "eggs" may be colored in alternate succession medium chrome green, vermillion red and cobalt blue, the "darts" straight gold, but the whole heavily antique glazed and often dusted as well.

Another example will be a leaf, berry and ribband carving applied to a bed or cabinet panel. After sealing with shellac the leaves are painted deep green, the berries deep red, the ribband gold bronze. The whole is then given a thin glaze of equal parts burnt umber and venetian red dry colors mixed in japan drier and benzine, and wiped from the high lights. After shellacing a heavy slush coat of rotten stone, turps and wax is brushed on all over and wiped off so as to be left showing in crevices only. The same color scheme may be carried out entirely or in part on flutings and beading so as to harmonize.

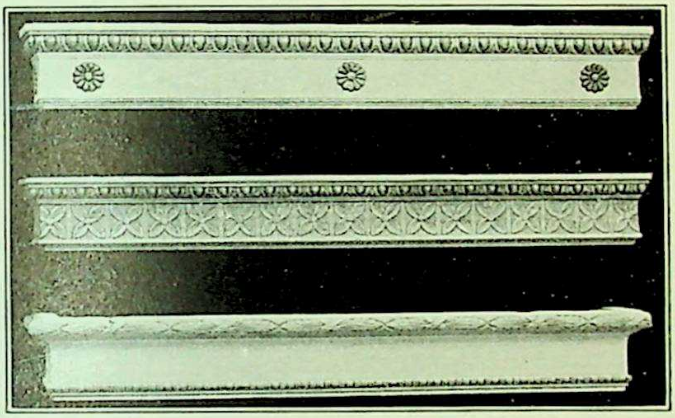


Plate XLV.—Examples of Carved Bases for Polychroming, All Calling for Hand Work.

### STIPPLED BASE

Raised stippling is described elsewhere—as a base for polychroming its broken surface suggests a treatment similar to that for carving except that the coloring is variegated rather than fixed by a set design. It is true that a pattern of a certain sort may be produced by twisting the stipple brush to produce repeat swirl and scroll effects, but these run into one another and could hardly be colored separately. It is found chiefly on gift and art objects—on furniture raised stippling is confined largely to overlays and imitation hammered metal effects in a straight pounded design.

If the tips or ridges of the stippling are too sharp and coarse they may readily be made smoother and more uniform with sandpaper. After sealing with shellac a gold or aluminum bronze base coat is applied, followed by white shellac. Thereafter one or more colors may be applied, each wiped off while still wet with varying pressure until the gold or aluminum shows through the high lights only. These japan colors should be mixed very thin so as not to hide one another completely and none should be applied until the previous coat is dry.

Some combinations which suggest themselves over gold bronze are: red, brown and green; over aluminum bronze, blue, lavender and magenta. None should be applied full strength but softened by the addition of zinc white unless it is planned to antique glaze and dust. In this case positive colors may be used, nor need there be any bronze undercoat unless desired. Again all of the coloring may be done with metallic bronze powders.

The above may be accomplished entirely with a brush. With a spray a watered silk effect may be produced by adopting a given base color such as aluminum bronze, then spraying green lacquer enamel from one side and red from the other side. Thus the object when viewed from one angle will appear a metallic green, from the opposite side a metallic red, both softened by the aluminum. Of course the lacquer should be sprayed on thin and the gun held very slightly above the level so as not to get on the other side of the ridges. Any number of harmonious color combinations may be procured in this manner, but the most delicate effects appear over aluminum.

### FLAT BASE

Even where the surface is level and contains no irregularities in which to catch the color, it is still possible to procure a polychrome effect. The method is much the same as for flat stippling except that two, three, four and even five colors are blended together instead of two. Oil colors are preferable to japan colors as they are easier working and can be made to dry more quickly by the addition to the turpentine reducer of a little japan drier. The colors should be selected for their fineness and

Plate XLVI.—Spots of Several Colors as Put on to Begin a Multi-Color Blend.

Plate XLVII.—The Multi-Color Blend Finished.

transparency; ordinary house painter's tinting colors will hardly do. It is also possible to secure very beautiful effects with metallic bronze colors and bronzing liquid, varnish type, and there is a wide choice of shades: pale, rich and old gold, lemon, orange, crimson, fire, magenta, green, blue and copper.

With a silk or very fine soft vegetable sponge a skillful hand may tap on the various colors and blend or stipple them into one another in such a way that they seem to drift into one another. By twisting the sponge a certain pattern may be introduced; any mistakes can be quickly rectified with a benzine rag. It is possible to spread the colors all over or deposit them here and there and then blend together or apply all color directly from the saturated sponge. Naturally the spray gun may be employed as well—it simply requires a different type of practice based on the same blending principles. (See Chapter IV.)

The base coat may be of any flat or gloss oil enamel or lacquer enamel which will form a harmonious background for the polychrome colors. It should be hard dry, but the various polychrome colors may be aplied while each is still wet. The various layers of color show through one another producing the mottled effect of a sunset or of an autumn forest viewed at a distance. Flat polychroming is not usually antiqued, first because the stippling is a form of glazing in itself and secondly because a skillful artist will choose and mix his colors so well that none requires softening.

A typical color combination for this work would be a tan background, stippled over with dark brown, green and red. It is also possible on lacquer work to mix various lacquer enamel shades with gold bronze in order to give an additional glinting effect. Polychrome for metal work is a specialized art (See Book V). Nevertheless most of the methods suggested for carved and stippled base polychroming will be found to apply very satisfactorily.

# CHAPTER XII

## CRACKLING

A HUNDRED and fifty years or more ago furniture was painted by the use of colors mixed in oil laid on coat by coat. It was a tedious process because the drying was slow and when a smooth finish was obtained it was often thought necessary to give it a higher lustre by the use of the so-called French polish. Shellac and linseed oil were applied to a pad and rubbed on with a circular motion, the operations continuing till the desired smooth glossiness appeared.

From the point of view of modern finishing technique this is bad practice. A quick-drying, short oil, brittle finish overlays a slow drying, very elastic one with the result that in time the finish cracks and crazes, or as we say, "alligators." The cause lies in the difference in rate of expansion and contraction with extremes of temperature whereby the long oil undercoats move too fast for the top coats and these have to give way in the unequal struggle.

### CRACKLING

A failure in finishing years ago has today become quaint and decorative. Special materials have been developed to duplicate it and the result is known commercially as crackling. The crackle finish is produced by means of an undercoat, a crackle coat and a finish coat. An undercoat is essential as crackling will not take place over bare wood or metal, and the undercoat must be of a lacquer nature—not paint or varnish. One or more coats may be applied as required to build up a smooth surface, usually lacquer enamel, in order to afford the desired contrast. Red crackle over black lacquer enamel gives an excellent oriental or Spanish vargueño effect, but for straight novelty work, lavender over green, blue over gray, brown over ivory, or any desired combination may be used. Similarly for a more subdued appearance black may be crackled over white or even black over black as for radio fronts, metal smoking stands and the like.

The crackle lacquer should be sprayed on (never brushed) after the lacquer enamel base coat has dried about an hour. For a minute or two the crackle lacquer will look like another solid covering coat, but will shortly begin to separate in an intricate design revealing the undercoat color between the irregular lines. After the crackled lacquer has dried for two or three hours a protective coat of clear lacquer should be applied. This may

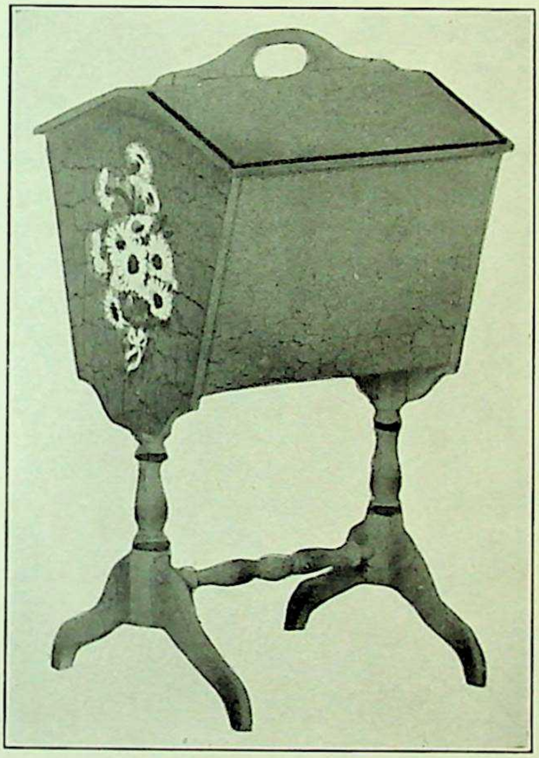


**Plate XLVIII.—Priscilla Cabinet, Showing Green Crackle Over Black Lacquer with a Transfer Decoration.**

be flat or gloss according to the lustre desired, but in either case it serves to bind down the crackle, brighten its color and preserve it from wear.

Crackle lacquer is sprayed on as any other lacquer, but no small practice and skill are required if the crackles must appear of a uniform size. In general the more reducer used to the gallon of crackle the smaller and more shallow will be the crackles; likewise the quicker the crackle coat dries (and its drying may be hastened by blowing a jet of fresh air on the wet work), the smaller will be the cracks. The obverse, of course, holds true in each case. Uniform film and even air pressure are other essentials, for it is useless to try and touch up a coat just crackling by going over it again. In fact it will be found best to test out any new work on a practice panel until assured that all conditions are right.

A variation of crackling, known as a "leather finish," is obtained by spraying on a base coat of clear gloss lacquer, followed by a coat of black crackle and then one of lacquer enamel. This will give only the crackled effect without color contrast—for example, the proper shade of light brown lacquer enamel for the final coat will give a very close imitation of pigskin. But even here a certain contrast may be secured as where an ivory lacquer enamel finish coat is antique glazed in brown and wiped so as to leave the glaze showing only in the cracks, protected with clear lacquer. In this manner high-lighted and shaded effects for cabinet fronts may also be secured by hand work instead of spraying.

# CHAPTER XIII

## FROSTING

FROSTING is a system of color contrast applied particularly to the uneven type of surface offered by wicker furniture, wicker being understood to include reed, fibre and willow, also such deep pored woods as oak. It relies for decorative interest on a color ground coat over which is applied another color of harmonizing or contrasting shade, wiped off while wet so as to leave the first showing only on raised parts and the second in depressions and pores.

The ground coat may be (1) a transparent aniline water stain, green, gray, brown, red, blue or yellow, the range of shades limited only by the proportions and number of powders used to the gallon of solvent, (2) oil or varnish enamel, (3) lacquer enamel, (4) bronze colors. (See Book V, Chapter VI, *Wicker Furniture.*) Once the stain is sealed with clear lacquer or shellac substitute and the enamels are hard dry, the piece is ready for frosting.

Two-toning, as the trade term for frosting also goes, may be accomplished with a number of different materials, according to the color and lustre desired, the nature of the undercoater and the speed of production necessary. Thus oil colors, alone or with white lead, have good lustre and are easy to wipe off, but are slow drying and may soften the paint or varnish undercoat, causing its lustre to deaden. Japan colors on the other hand will dry fast but to a dead flat which requires a clear top coat to brighten up and are hard to wipe off. Both types should be reduced to fairly thin consistency with benzine, adding to the former a little pale japan to hasten the drying and to the latter a little linseed oil to retard it.

The best all-around frosting color is one ground in half oil and japan, thus embodying reasonably fast drying, elasticity, adhesion and satisfactory gloss, together with easy wiping and minimum danger to the undercoat. They may be obtained so manufactured in either paste form to be reduced half and half with naphtha for spraying or in liquid form ready to brush as taken from the container.

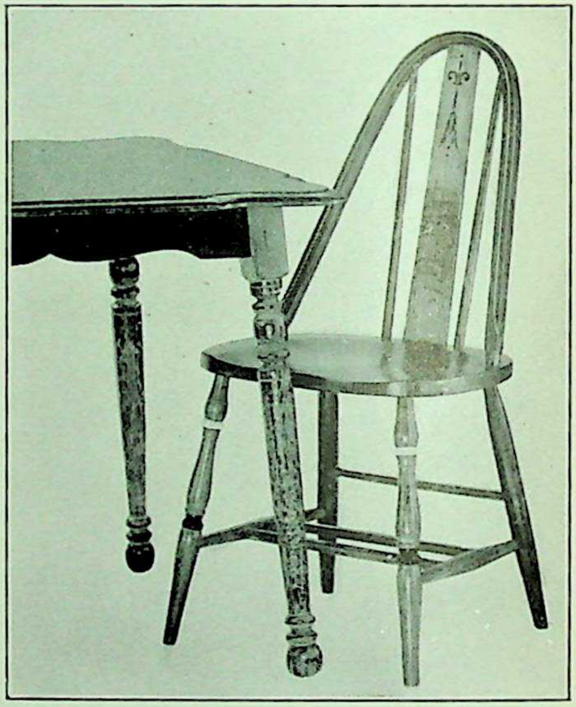


Plate XLIX.—Flat Frosting with White Filler Over Dark Gray Water Stain on Table Legs.

## APPLICATION

Frosting color may be sprayed, brushed or even applied with a cloth. As soon as it has flowed out, but before it has set, the time varying with the material, it is wiped off all raised parts with a muslin rag, frequently turned so as to present a clean wiping surface. A strong pressure should not be necessary—

if it is, the mixture is too heavy or has dried too long. Similarly the material should not be too thin or it will continue to run and seep after the wiping. The smear should show only in the twistings—the body color only on the high lights.

Bronze colors may also be used where a novelty effect is desired, the powder being mixed in japan gold size and sufficient oil to assure easy wiping. If bronze color constitutes the base coat it should be protected with shellac unless lacquer was the vehicle in which case the frosting may be applied direct. In all frosting care should be taken that the liquid of the two-toner is not a solvent of the base coat; if it is, a shellac sealer coat should intervene to prevent damage in wiping.

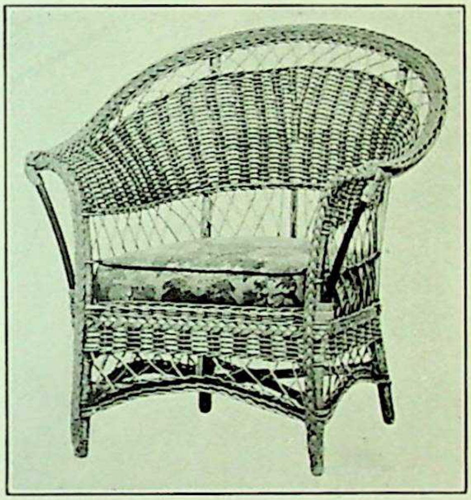


Plate L.—Gray Painted Wicker Chair Frosted in Dark Blue.

Favorite color combinations for two-toned or frosted wicker furniture include gold, salmon or Chinese red over black; white, vermilion or yellow over blue; light gray, aluminum or deep red over brown; black, red, lavender or orange over green; blue, black, dull red or brown over ivory; blue, green or mauve over cream; white, gray, black or aluminum over crimson; blue, red or black over aluminum. Where not frosted or only lightly frosted wicker furniture may also be spray-shaded in the same combinations of color.

### FLAT FROSTING

A readily recognized form of flat frosting is offered by silver gray oak which has been popular for years, especially on breakfast room furniture. The wood is first stained gray, preferably with a water stain in order to assure clearness of tone. This is sealed with a thin coat of white shellac followed by white filler (paste white lead or zinc oxide and japan drier or a mixture) reduced and applied like ordinary wood filler. This when dry is protected by white shellac, followed by wax. Any attempt to use orange shellac, varnish or even ordinary lacquer will spoil the effect owing to the tendency of their inherent amber coloring to combine with the blue cast of the stain and give an unsightly greenish hue.

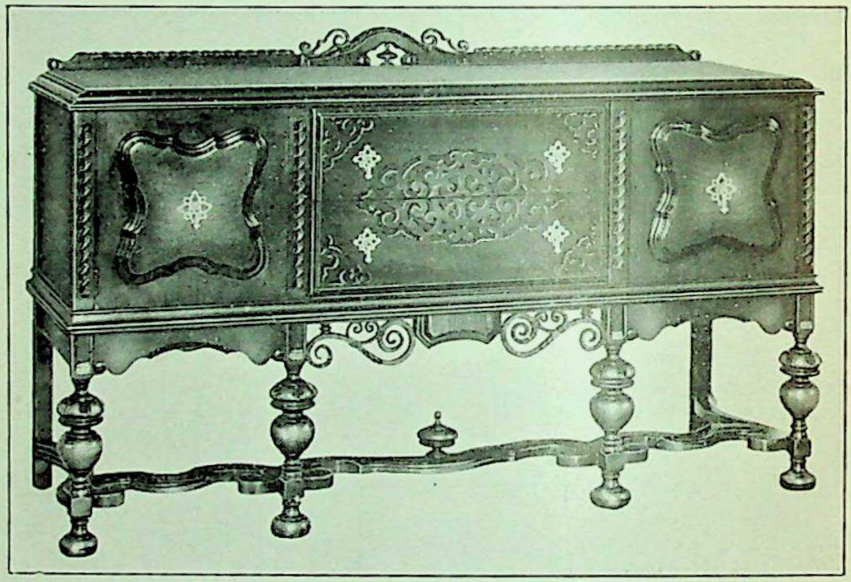


Plate LI.—Walnut Buffet, Showing High Lighted End Overlays and Sand Blasted Marquetry Effect on Center Drawers.

For novelty effects a blue, green or brown aniline water stain may be used as with willow and fibre furniture. The use of a light brown solution gives what is known as an Hungarian finish—if of a deeper tone, Austrian. All call for a white filler except Italian oak which, through a gray tinted wax over a blackish brown stain, gives an open-pored semi-frosted effect.

A new flat frosted finish calls for lacquer enamel of desired shade reduced very thin, then sprayed or brushed on the oak, let dry a few hours, striped, banded or decorated as desired and followed by white wax which is allowed to set twenty or thirty minutes; first wiped across the grain, then rubbed with it to a polish. This provides a speedy as well as a highly decorative finish, but for table tops or wherever heat or hard wear is expected, it will be well to substitute white filler for the wax, sealed with one or two coats of pale lacquer. The number of combinations with white wax or filler is limited only by the number of shades of lacquer enamel available, but it will be found that the deeper tones offer the most satisfactory contrasts.

## CHAPTER XIV

## SPATTERING AND VEILING

THE application of the background color for a spattered finish is normal in every respect—two or more coats of oil or lacquer primer and enamel of desired shade for wood or metal. If lacquer is used it is best to use lacquer throughout, i. e., for primer, enamel and spatter colors; similarly for an oil finish, paint primer, oil enamel and enamel spatter colors. The lacquer should be sprayed entirely, but the paint-enamel system allows of a brush alike for undercoat, finish coats and spattering.

### SPRAY SPATTERING

As soon as the final enamel coat is dry, about two hours for lacquer and twenty-four or more for enamel, other harmonizing or contrasting shades of lacquer enamel are spattered on the work to give a pebbled or salt-and-pepper effect. To accomplish this the gun is held about three feet away from the work and tilted upward slightly owing to the tendency of the material to travel in an arc, rather than in a straight line as when sprayed in a mist. A low air pressure is used, about 20 or 30 pounds is sufficient, thus causing the material to go on in specks, instead of covering the work solidly as would be the case were the material vaporized at a higher pressure and thinned with reducer.

The lower the air pressure the larger and coarser will be the flecks or blobs and the closer the gun will have to be held in order for the material to reach the work at all since there is less air to carry it. If the spattering is done while the ground coat is still wet, immediately in the case of lacquer, the flecks

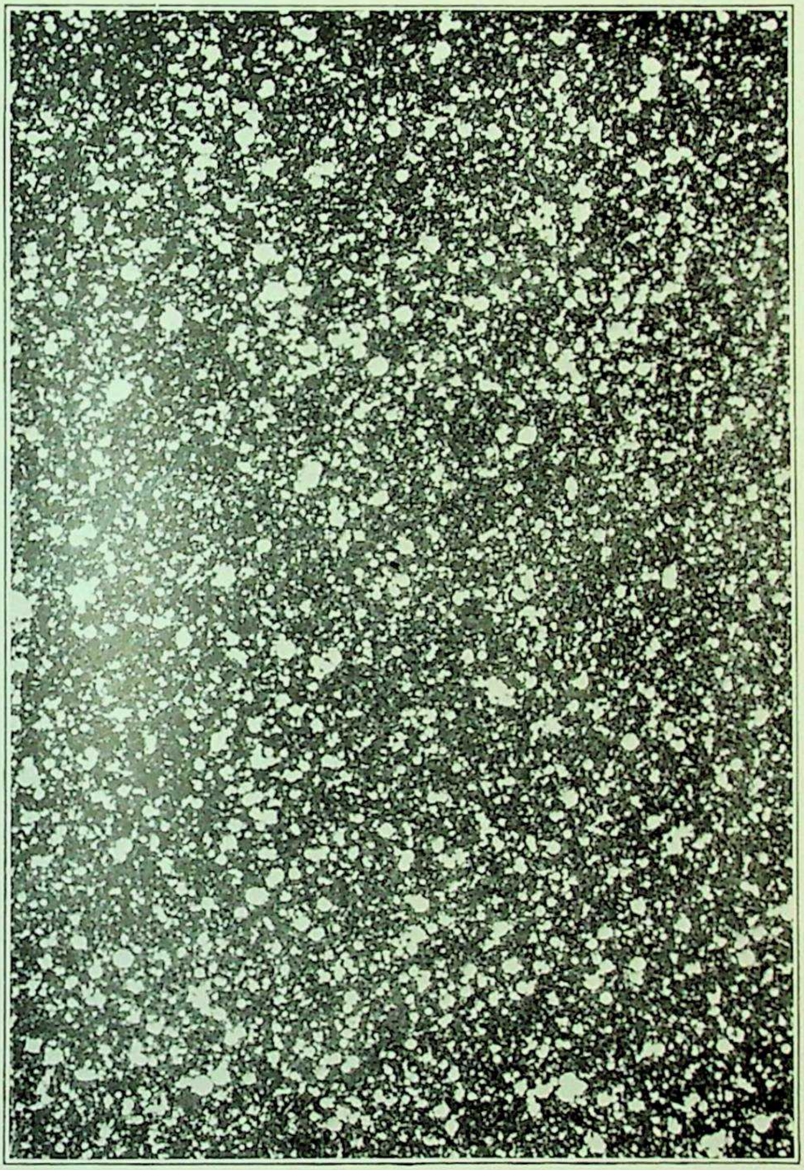


Plate LII.—A Spatter Finish Produced with a Spray Gun.

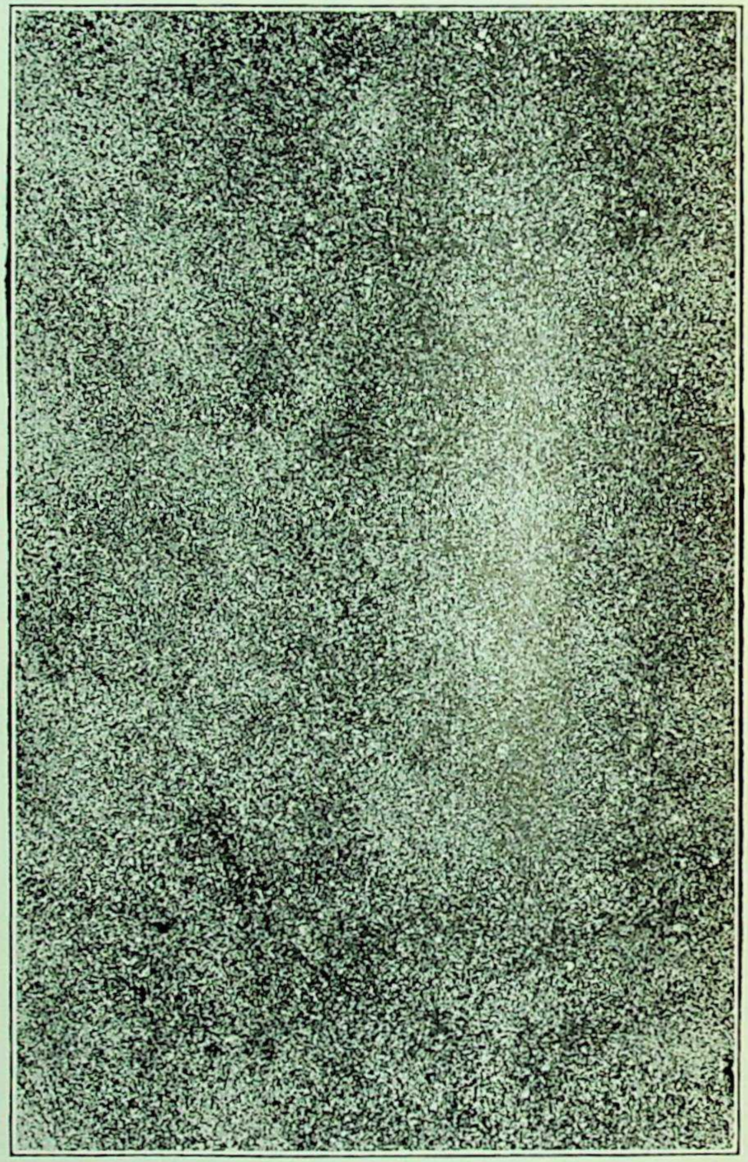


Plate LIII.—A Spatter Finish in Four Colors Done by Hand with a Four-Inch Flat Wall Brush.

will sink in and give a smooth finish; if the ground coat is allowed to dry the flecks will knit to it but lie on top and feel rough to the touch. It is necessary where spattering is applied only to a portion of the work, to mask off that part to remain in a solid color.

### BRUSH SPATTERING

The principle and effect is the same as for spraying though not likely to be as uniform in result unless performed by an expert. A coarse or fine brush, according to the effect desired, is dipped in the enamel, then flicked on the work with a jerky motion, perhaps by knocking against the back of the left hand. Oil or japan colors, properly thinned, may also be used according to the speed demanded in drying, but such work must be protected by a clear coating.

### VEILING LACQUER

A variation of spattering, known as "veiling," calls for a special lacquer enamel which also sprays on in blobs, but with each blob leaving a hair-like tail. These tails cross one another in a veined effect like a spider web and lie flush with the undercoat. The manner of application is the same as for lacquer spattering; the material and pattern only are different.

### COLOR COMBINATIONS

One, two, three or four colors may be spattered or "veiled" on with the result that a pleasingly veined or speckled appearance is presented which yet allows the predominating base color to show through. Ordinarily it is not necessary to apply any clear lacquer coat after a lacquer spattered effect has been produced, since the spattered enamels bind themselves to the underneath lacquer coat. If desired, however, to soften the colors or to provide additional protection, a coat of clear gloss or flat lacquer may be applied after the spattered lacquer enamel has dried one or two hours.

While the number of spatter finish color combinations is almost without limit, it is well to bear in mind that random selections may involve a clash. Here are a few that are standard and popular, the base color in each case being named last; chrome green and carmine on white; chrome green and scarlet on ivory; scarlet and white on chrome green; white and light blue on orange; light blue and white on chrome yellow; orange and white on light blue; orange white and chrome green on

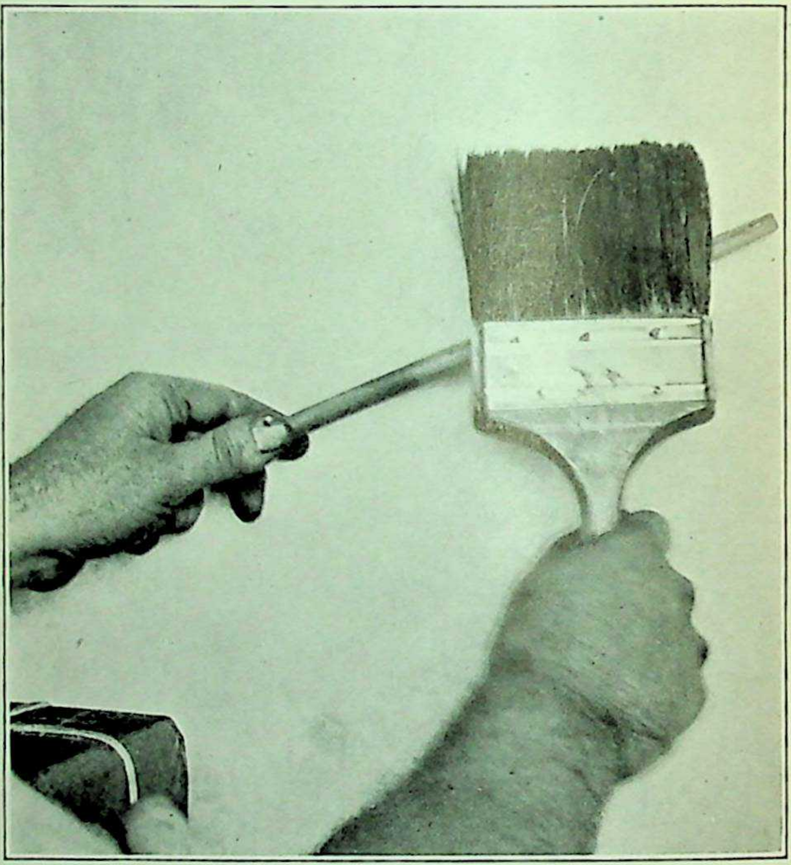


Plate LIV.—The Method of Holding and Using the Brush with a Stick for Producing Spatter Finishes.

black; light blue, white and scarlet on light gray; deep brown on light brown; dark blue on light blue; tan on cream or ivory.

### ON FURNITURE

The field for spattered effects is principally confined to novelty furniture, breakfast room furniture and the like. It is rarely used all over but generally on overlays, borders and small shaped surfaces and may be used in conjunction with mist shading to accentuate the darker portion. When handled with restraint in a tone closely harmonizing with the background color it is restful; when applied in successive strong colors over a contrasting body color on small areas it is novel and striking.

# CHAPTER XV

## RAISED STIPPLING AND GESSO

ONE of the most popular means of producing a finish background of variegated texture is through stipple paste, a material which permits of giving a smooth surface almost any desired degree of roughness. With either wood, metal or composition as the base, a wide variety of surface patterns and other effects may be developed, ranging from carved wood and hammered gold to twisted and deeply pitted polychrome blends. There is a choice of two different stipple materials, paint paste and lacquer paste; both constitute primarily a background to be colored and possibly shaded or polychromed. Lamp bases, picture frame mouldings, art objects, imitation of metal and furniture overlays are all appropriate subjects for this type of decoration.

### MATERIAL FORMULAS

Paint stipple paste, or "gesso," for any considerable amount of work is best purchased ready made; for small jobs it may be shop-mixed in various ways of which the following are examples:

(1) 2 lbs. plaster of paris, 2 lbs. whiting, 1 lb. dry white lead, 1 lb. glue, 1 gal. water, thickened if desired with additional whiting, thinned with more water and colored as desired with dry colors.
(2) Chinese red clay mixed stiff with glue and water.
(3) White lead in oil, whiting, rubbing varnish and japan drier, mixed to a putty and thinned if desired with benzine.
(4) Calcimine, plaster of paris and water.
(5) Mix whiting and water to cream consistency and pour into a double boiler containing 1 part varnish, 4 parts

boiled linseed oil and 6 parts liquid glue, stir and cook ten minutes over a slow fire, then pour into a milk bottle and cork tightly.

(6) Any of the patent plastic wall finishes or patching plasters such as are used by painters.

It will be seen that there is not only a wide choice of materials but that many of the formulas shown are general. This is due to the fact that stipple paste, or "gesso" as it is often called, should vary in consistency according to the work and manner in which it is to be applied. If done with a knife or modeling tool, the paste should be thick and fairly stiff; if with a brush more fluid; if with a spray, considerably thinner and finer. Similarly the drying should be controlled. On large work to be hand-stippled the paste should remain plastic long enough to get all over; on small work it can be allowed to stiffen as quickly as desired. Again, some of the formulas are oil base, others water-glue—the former are naturally more elastic and better suited to metal than the latter which are more widely used on wood, glass, plaster and compo. With all tight adhesion is of course of primary importance.

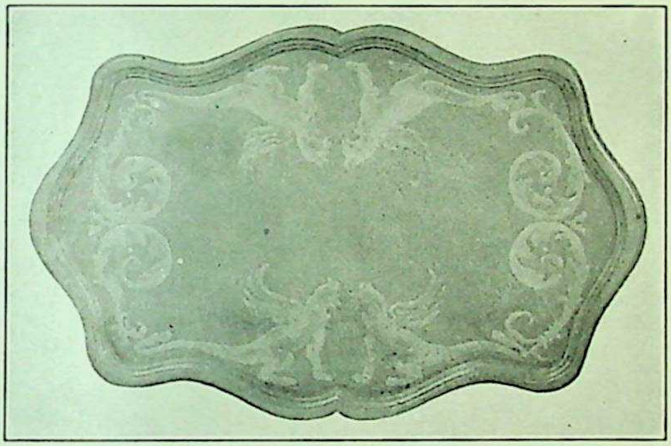


Plate LV.—Modeled Gesso on Table Top.

### ART RELIEF

Border mouldings are built up by tacking or glueing on straight mitred or bent basswood strips, the lines kept straight with the fingers or a bit of wood; figure designs are first traced or pounced and then built up, coat on coat, to the desired height. (See Chapter X.) A flat bristle brush may be used for these operations.

### SPRAY STIPPLING

Wood and metal are first given a sealer coat of thin shellac, plaster and compo shellac or glue, glassware nothing, but all must be thoroughly clean and dry. The stipple paste may then be knifed on if a heavy coating and a coarse pattern is desired or thinned and brushed or sprayed on. For spraying considerable air pressure is required to force out the material since its consistency is necessarily heavy and this naturally makes suction feed out of the question. A large nozzle opening is also essential. For brushing an ordinary bristle brush of convenient size will serve, but however applied, it must be borne in mind that the thicker the coat and the stickier it is allowed to become the rougher it will become in texture.

### HAND STIPPLING

Thus when the plastic coating has been allowed to set until the desired stickiness has been reached, from ten to thirty minutes ordinarily, but varying with the make-up, it is ready to be stippled or modeled. This may be done with a stencil brush, a sash tool, a ball of burlap or tough paper, a modeling tool or a sponge moistened in the solvent of the paste or even the fingers. The motion of the hand will create the pattern, thus, up and down brush pouncing will draw up the finish in tips, a circular motion will create a scroll—the possible variety is unlimited. The more fluid the paste the more blurred will be the design, the stiffer, the less easy it will be to work. The

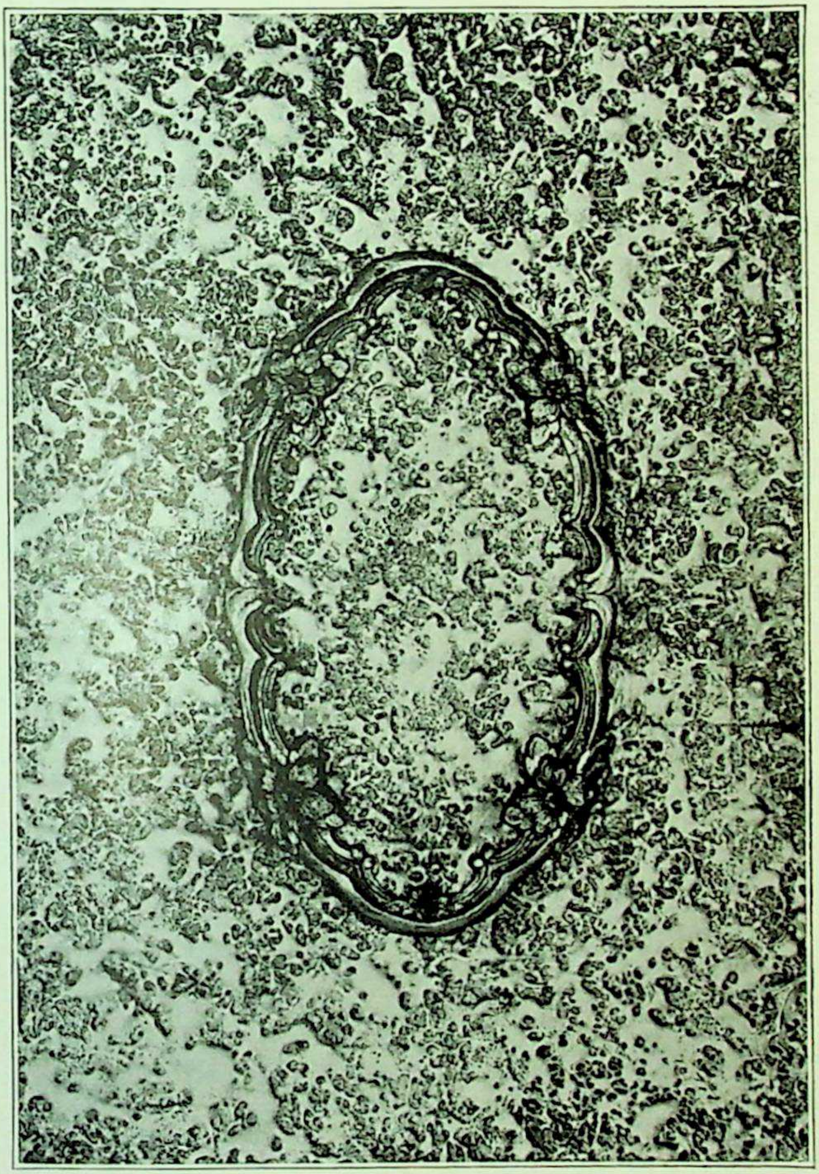


Plate LVI.—A Beautiful Decorative Finish Produced with a Spray Gun and Paint Stipple Paste.

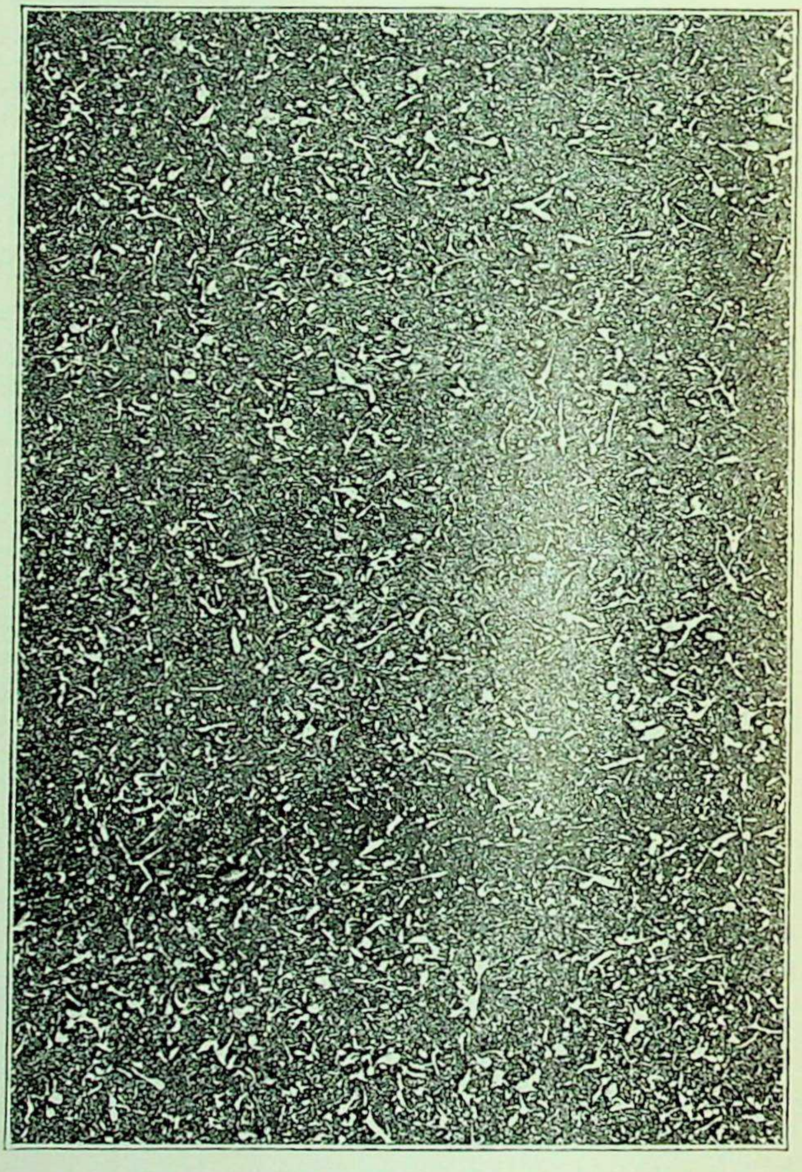


Plate LVII.—A Finer Texture Produced by Spraying Lacquer Stipple Paste.

right stage, in fact, the entire process, is best determined from actual experiment.

As soon as the manipulation is completed the paste should be allowed to dry until hard, the drying time varying according to the character of the formula. On flat surfaces it is often the practice to press down on the partly dried finish with a clean painted board in order to flatten the peaks and ridges; rounded surfaces and figures are smoothed down with dry sandpaper and the work dusted out clean. The finish is then ready to be coated with thin shellac to seal it up for the color coats to follow.

### COLOR AND DECORATING

From now on it is largely a question of color combinations as described elsewhere under "Polychroming." In imitating metal the paste is pounced with a bristle brush or scrubber to produce a hammered effect, using thin semi-flat black enamel or japan color for wrought iron and gold bronze and dry burnt umber mixed in varnish for old gold or brass effects, both applied over the shellac sealer coat. These finishes are sometimes employed on the Spanish type of underbracing and overlays where wood instead of metal forms the base, supplemented by touches of green and red glaze on any projections or leaf and vine carving. The same is true of lamp stands which are stippled in a twisting figure, and overlays colored ivory and antique glazed, or colored in brighter tones and color glazed in a harmonizing or contrasting shade.

### LACQUER STIPPLING

Lacquer stipple paste must be sprayed on and should be purchased ready-made. Most brands come ready to apply and require a very low pressure on the nozzle with a very high one on the material in order to force the material out in "blobs," somewhat as with spattering. Though the depth of the stipple may be varied by regulating the air pressure and amount of material going through the gun, it is not possible to secure

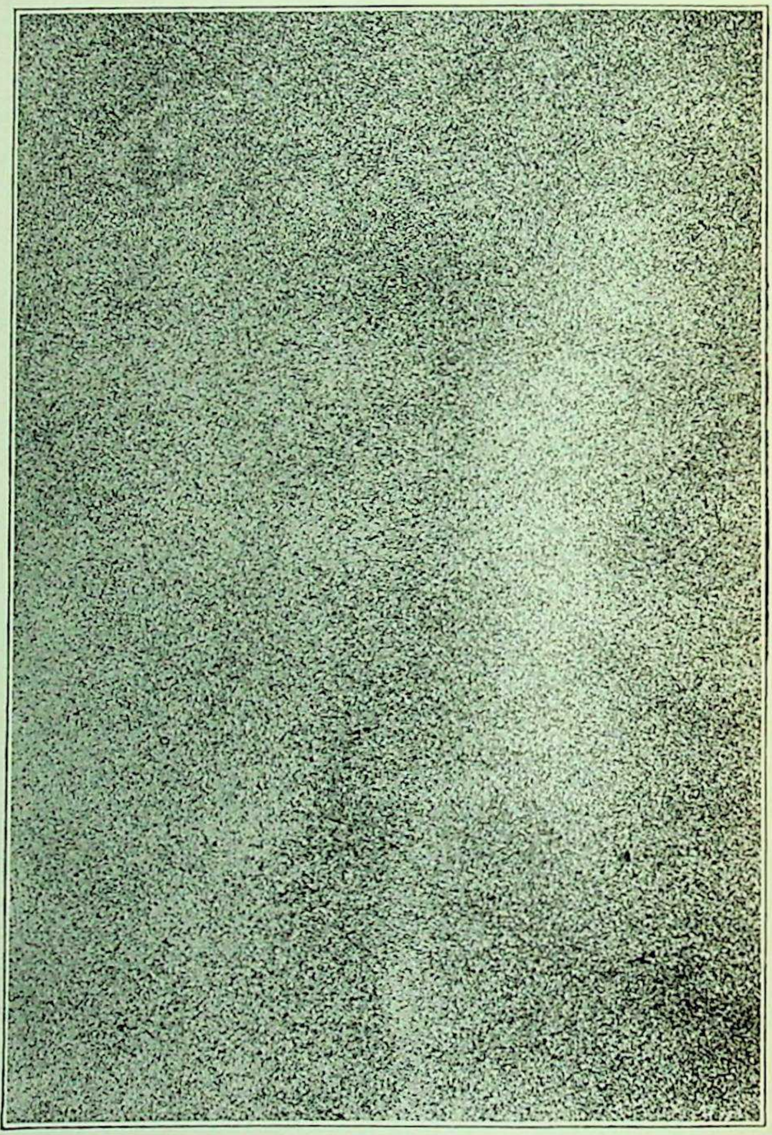


Plate LVIII.—A Very Fine-Grained Stipple Texture Put on with a Spray Gun. See Page 257, "Spray Stippling."

effects as coarse nor patterns so varied as with hand stippling. Lacquer paste is speedy, however, requiring but an hour for drying and no sanding and hence is popular for furniture work. The coloring and decorative processes are the same as for the paint paste (See also Chapter XI).

# CHAPTER XVI

## STENCILS AND STENCILING

BRIEFLY defined, a stencil is a design or pattern cut out of a thin piece of paper or metal in such a way that by the application of paint over it a clear cut impression is conveyed to any reasonably smooth surface. Furniture stencils may be traced on stiff paper and cut with a sharp knife on glass or purchased ready-made in special or stock designs. With proper care a single pattern may be used on almost any number of pieces.

### TYPES OF STENCILS

The simplest form of stencil is known as the ordinary one-color type, meaning that the entire impression may be conveyed in one operation. It is extensively employed on juvenile furniture, kitchen cabinets and certain classes of semi-utilitarian household furniture in metal and wood with plain one-tone backgrounds. It may readily be rendered more interesting where desirable by filling in different parts of the same design with harmonizing colors. If a rose spray, the rose may be filled in pink or red, the leaves light green and the stem dark green, thus more closely approximating nature. To carry this idea further the colors may be shaded out with a small artist's spray or by hand while still wet before or after the stencil has been lifted.

*Background stencils* are handiest for use in transferring all-over designs as where a complete surface is to be decorated in a filigree or network effect. In making the stencil the background instead of the design is cut out and when sprayed in light blue over a dark blue painted surface, for example, a very pretty medium blue effect is secured through the harmony of the two shades. Harmonizing rather than contrasting shades are preferable, and if the stencil is skillfuly cut and a good arabesque or similar design is chosen, the result often closely approximates an elaborate marquetry inlay pattern.

*Outline stencils* represent a compromise between pattern and free-hand decoration. The small dashes act as a guide when transferred with burnt umber or burnt sienna to the ground color of the surface similar to the charcoal dust pouncing used in hand painting. It is most favored where an antique glaze is employed, the glaze being wiped out of the pattern while still wet so as to leave a light uniform surface on which to apply the stencil color with an artist's brush. Such a design may of course be shaded and high-lighted as suggested by the nature of the original being copied.

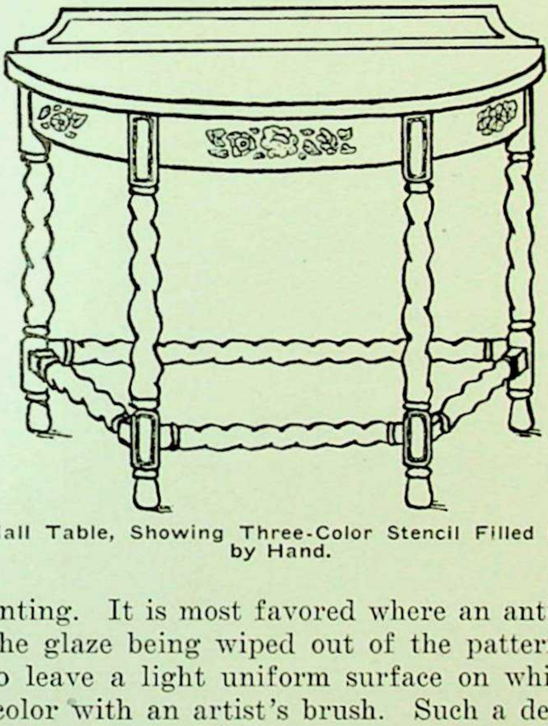


Plate LIX.—Hall Table, Showing Three-Color Stencil Filled in and Shaded by Hand.

*Double stencils* have for their object the transferring of a pattern without showing the blanks left by ties. A one-color ordinary stencil cannot be made to produce two-color work without the necessity of filling in different parts of the same stencil in different colors with the attendant risk of smearing or getting a color in the wrong opening. Two operations are of course required with a double stencil, the second stencil either supplying what is lacking in the design of the first by reason of the ties or being used to fill in a portion of the pattern in another color. Examples would be a continuous band or a leaf—stem and rose spray respectively, the former in one color showing no ties, the second in two colors showing ties.

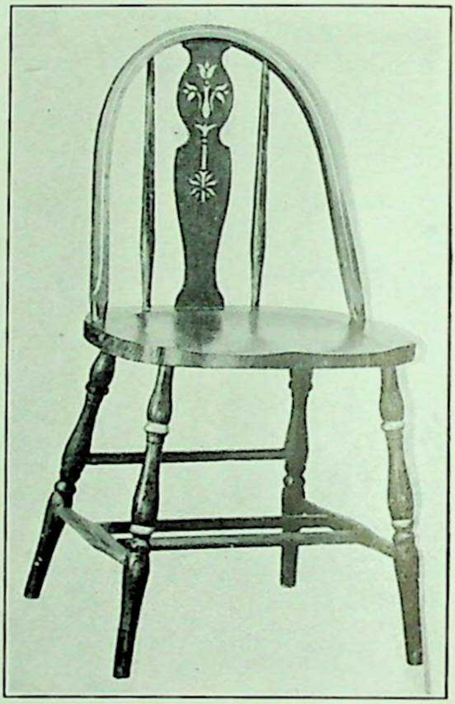


Plate LX.—One-Color Metal Stencil on Chair Back.

The so-called *silk screen stencil* has of late years acquired great popularity due to its flexibility of use. The material used is No. 8 bolting silk costing about $9.00 a yard, cut and stretched tight in a wooden frame of desired size. A design is cut from 5/1000″ thick sheet celluloid with a knife and placed on a table;

the silk screen is placed over this and amyl-acetate coated on, pressing the silk at the same time against the celluloid. This partially dissolves the sheet, uniting it where desired to the fabric and forms a permanent stencil. Another method is to shellac a sheet of manila paper, then cut the design out after which the paper when dry can be attached to the silk by pressing it with a warm iron. This should be done against the back of the paper so that the iron does not come in contact with the shellac. Silk stencils are virtually "tie-less" in that the color works under the threads and shows no mesh on the surface.

Plate LXI.—Silk Screen Stencil on Chair Back, One Color.

## STENCILING PROCEDURE

There are several essentials to stenciling all of which must be carefully observed if the work is to be successful, for even though the process appears simple, there are a number of possible slips.

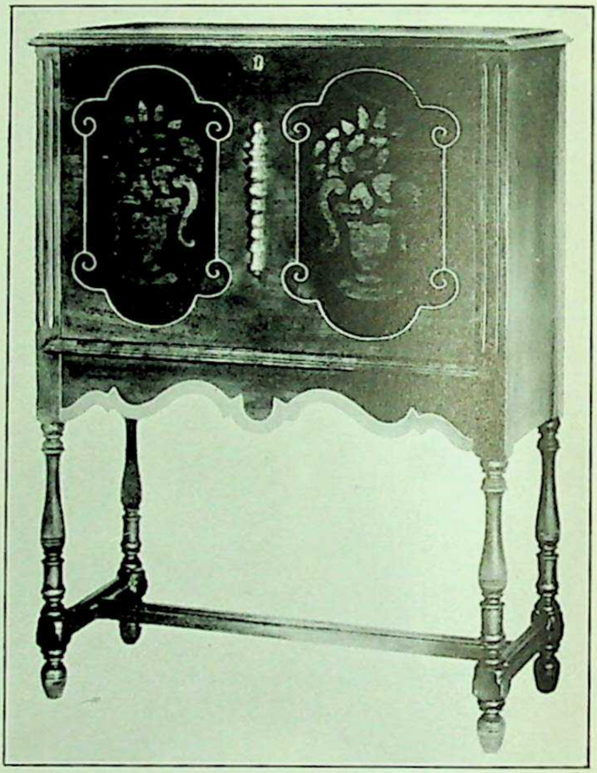


Plate LXII.—Stenciled Cabinet, Showing Designs Produced by Spraying Bleaching Lacquer on Bare Wood Before Finishing.

In the first place the stencil, be it paper, metal or fabric, must lie absolutely flat on and flush with the surface. A properly sharp, clear outline is impossible if some of the paint, ink or lacquer gets under the edges and blurs the outline when the stencil is lifted. Secondly the stencil must be kept clean—it is best to wash it on both sides after each operation with the solvent of the color used, naptha, alcohol or water. Thirdly the stencil material must be of a nature that it will not be attacked by the solvent—paper should be oiled and fabric well fortified with filler. If water colors are used, the paper should be shellaced or lacquered.

Ordinarily the paper stencil may be held flat with the hand while the color is daubed on, especially where the stencil is small and the work must be done rapidly. For larger stencils push pins or a mixture of gelatine, sugar and glycerine is used—suitable where less rapid working is satisfactory. Metal stencils are held flat partly by their weight and partly by hand pressure, whereas silk screen stencils are usually mounted in a heavy frame, glued or tacked to the bottom side. For spraying the frame is given high sides.

Stencil colors are applied by brush, spray, squeegee or sponge. When brushed the action is rather of pouncing than of spreading and the brush must be held straight up and down at all times to prevent the bristles working under the edge of the stencil and mussing the edge. Of course special stencil brushes are essential and no attempts should be made with flat, soft bristle or even oval brushes. The size depends on whether one-, two- or three-color work is being done and whether the openings are large or small. A sponge or squeegee is used on silk screen stencils.

## STENCIL WORK

The colors used in stencil work depend on the manner of application. For brush and squeegee, oil tube glazing or oil and japan colors are used and their consistency should be about that of thick cream. A good binder is essential in order to prevent running—japan gold size is a favorite if the material contains much oil. Where gold, aluminum or copper bronze is transferred japan gold size is first pounced over the stencil opening and upon its removal, as soon as the size is in the right tacky condition, the powder is blown on. It will adhere only to the size as transferred through the stencil. The same general system is employed with gold or silver leaf which is layed on with a gilder's tip and trimmed by pulling off loose edges after adhesion has become firm.

Lacquer enamels may be used providing, of course, they are sprayed on. However, their consistency must be just right and the spray hand must be skillful in order to avoid a blurred edge which will invariably result from spraying at an angle, spraying too thin a material or not spraying enough material on. For this reason many spray over lacquer enamelled furniture with japan or oil and japan colors which are more opaque, flow more readily and dry almost as quickly. In spraying over a stencil it is essential that the paper or fabric be as thin as possible as thick edges will cause "dusting," which has to be smoothed out by spraying on reducer.

Distemper colors may be applied with a sponge and are excellent for shaded or stippled effects.

## COLOR HARMONY

The choice of color so far as harmony is concerned is one difficult to learn from a printed page. Some of us have the sense naturally, others can acquire it through study and practice, others may never hope to have it, though in no sense what is known as "color blind." The easiest and safest method is wherever possible to study nature, for nature never clashes even where all colors are used, as witness the example of the rainbow.

Stencil decorations must not arrest the eye like a circus poster, but soothe it like an autumnal landscape or a summer sunset. Single color stencils over backgrounds are appropriate as follows: blue, brown or pink on ivory; black, dark blue or dark gray on light gray; medium blue on white; yellow or blue on pink; lavender or pink on baby blue; black or red on pale green. Where two or three colors are used in the same stencil either as a picture, a floral or repeat design, extra caution is required—if too strong a burnt umber-raw sienna antique glaze should be lightly sprayed or wiped over it to cut down the boldness.

## STENCIL DESIGNS

The choice of design in stencils is almost without limit. Unfortunately, due to the fact that many of us think of stenciling in connection with the very plainest patterns, the fullness of its decorative possibilities has never been entirely appreciated. As a consequence only the simplest designs are employed and these

Plate LXIII.—A Roman Stencil Design.

largely on the more inexpensive types of breakfast room and juvenile furniture. Then, too, the wide choice of decalcomania transfers, simulating so closely the effect of expensive hand-painting, has curtailed the demand for stencil decoration.

The safest patterns for furniture stencils are conventional ones in single or at most two colors for the reason that more elaborate results are easier with decalcomania transfers. The

Plate LXIV.—An Egyptian Stencil Design.

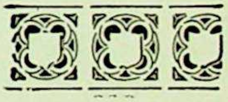
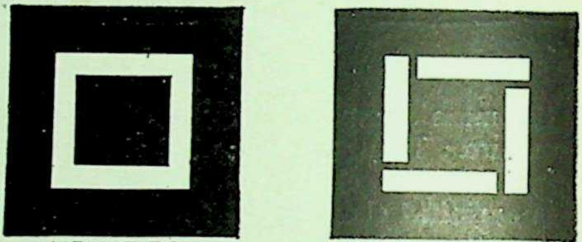


Plate LXV.—A Gothic Stencil Design.

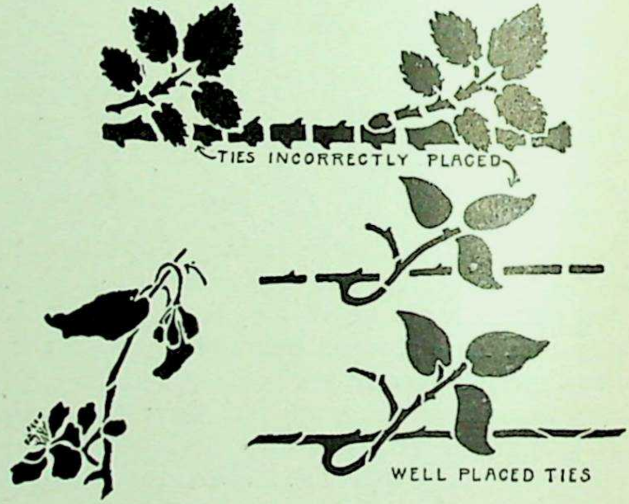
greatest modern field for stencils is in painted furniture, particularly of the juvenile or breakfast room type. Such furniture is turned out in large quantities, the bulk of it frankly to sell at a price, and here stencils undoubtedly offer the cheapest and easiest method of decoration.

For nursery furniture there suggest themselves animals, toy soldiers, birds, fruit, landscapes and the like. For older children's furniture there are conventionalized groupings of flowers, leaves, fruits and wreaths. These are also appropriate for breakfast room furniture where they are apt to be carried out with striping or banding to set them off. Occasionally a border line of the stenciled type will also be seen.

Where the furniture is in a walnut or mahogany finish and not of the painted or frosted oak kind, stencils may be employed to reproduce the effect of scrolled overlays or marquetry in arabesque and foliated patterns. Sometimes this is done with flat colors in soft greens, blues and tans then varnished or lacquered over. A new bleaching lacquer has been developed which, when sprayed over the stencil, seals the wood so that when stained and filled, the design appears as a very effective imitation of lighter pattern inlay (See Chapter VII).

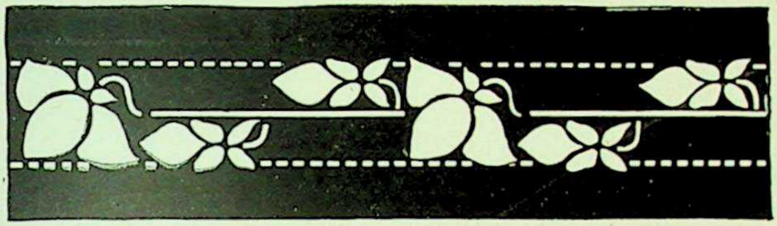


WITHOUT TIES WITH TIES

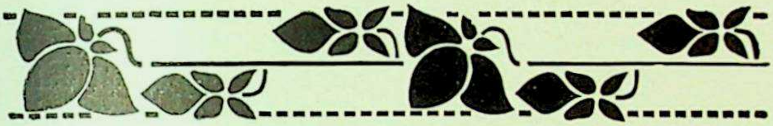


NEEDS NO TIES

Plate LXVI.—"Ties" Correctly and Incorrectly Placed.

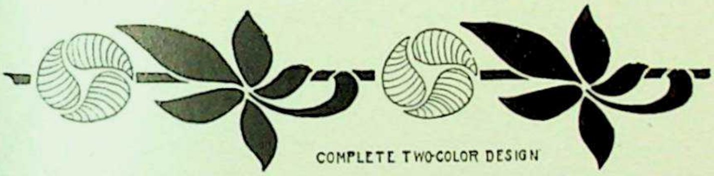


STENCIL PLATE

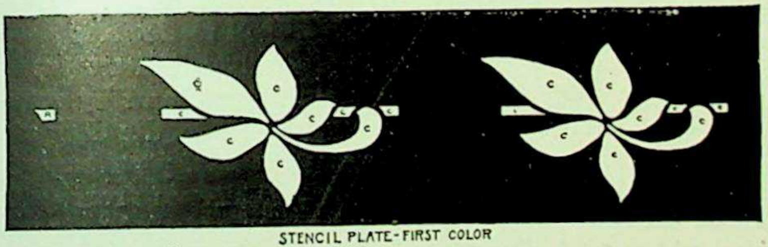


STENCIL IMPRESSION

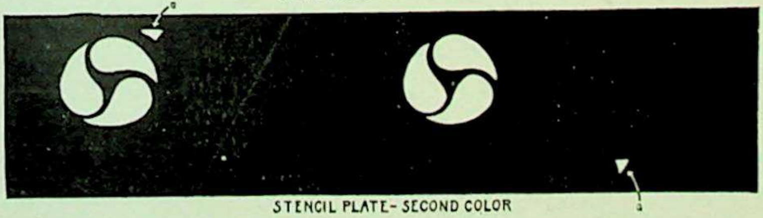
Plate LXVII.—One-Color and Background Stencils.



COMPLETE TWO-COLOR DESIGN



STENCIL PLATE-FIRST COLOR



STENCIL PLATE- SECOND COLOR

Plate LXVIII.—Color Stencils for Two-Color Work. G, G, in Lower Stencil, Are Guide Marks.

# CHAPTER XVII

## DECALCOMANIA TRANSFERS

AS THE art of cabinet making passed in a century and a half from the individual handicraft of the joiner's shop to the mass production of modern furniture plants, so the hand-painted decorations of the Georgian period have developed into the decalcomania transfer of today. In the days of Hepplewhite it required months to turn out a single suite that now passes in a single week from unshaped lumber to a complete, finished unit ready for shipment.

### METHOD OF MANUFACTURE

In the making of modern transfers few realize how freely the designing artist may choose his colors; no matter how intricate or delicate his elaborate figures, landscapes or flowers, the mechanical equipment will reproduce them as faithfully as the original. Decalcomanias once were confined to flat effects—now by a patented process held by a leading firm, the most minute hair lines of the artist's brush are duplicated and by running the hand over the finished transfer the relief of the design may be felt exactly as with oil hand painting. Many an expert has to examine closely in order to tell the difference from genuine oil colors.

Yet the process of decalcomania manufacture is by no means simple. The design is first painted by the artist on a lithographer's stone or on a copper plate with special heavy pigments, but in the reverse of the way it is to appear when applied from the transfer. It is then printed in series on special gummed paper which must be strong enough for ordinary handling but porous and yielding enough to come off readily upon being dampened. Finally each transfer must be trimmed so as to leave the minimum amount of paper surrounding the design consistent with keeping it intact and rendering it easy to lay.

While all decalcomania makers carry thousands of stock designs, the furniture manufacturer ordinarily prefers procuring an exclusive one. He can have his own designer or artist prepare this or it may be both prepared and executed according to his ideas in the studios of the decalcomania maker. The economy, of course, is greatest where the largest number of transfers of a given design are used, since the chief expense lies in the art work and preparation of plates. Where relatively few are needed a stock design will serve all practical purposes.

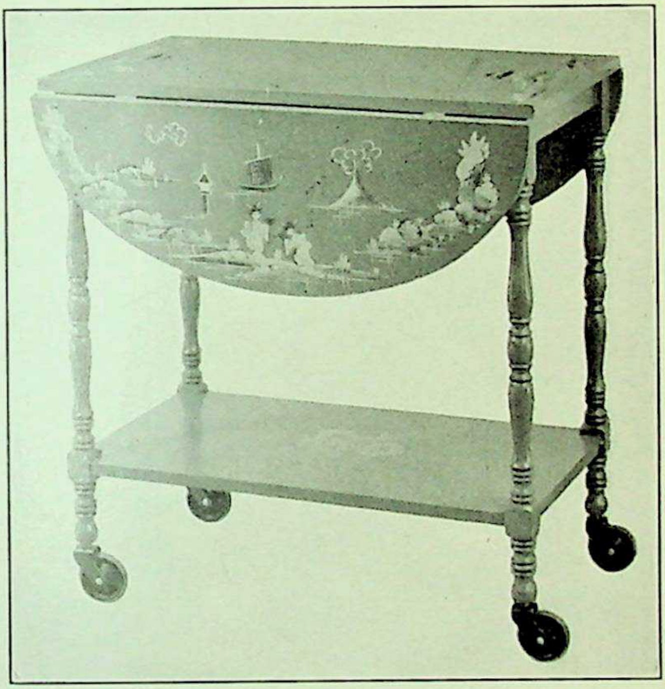


Plate LXIX.—Large Decalcomania in Chinese Pattern.

## CHOICE OF DESIGN

Floral designs follow the rules for hand painting and range from a single bold color to nature's full array in antiqued sprays, festoons, groups, baskets and nosegays adapted in size to the space on which they are to be applied. Marquetry and inlay transfers reproduce the most delicate wood grain coloring, lights and shadows and combinations of striped, pencil and fancy markings. In conventionalized classic forms there are arabesques, the acanthus, Roman figures, urns, horns of plenty, wreaths, shells, torches and the like in shaded black and white and for band borders, the Greek key, egg and dart, ribbons and Egyptian lotus, not to mention straight lines in various thicknesses, colors and corner variations.

There are even flat and slightly raised Chinese figures and landscapes for furniture of oriental inspiration in all appropriate colorings. For juvenile furniture, where transfers have long contended with stencils for supremacy, there are a profusion of animals, Mother Goose characters, fruits, flowers, etc. Be the period Egyptian or a company trademark, Renaissance or nothing in particular, there is a design to fit it at almost every range of cost.

## APPLICATION

To lay a decalcomania transfer properly it should be placed face up on a smooth surface and the colored face then coated evenly with either the special cement furnished by the maker or a good varnish reduced to fairly thin consistency with turpentine, using a soft brush of convenient size. For quicker drying some use japan gold size or even Le Page's glue, rubbing it on thinly with the fingers. Shellac, shellac substitute or library paste are not advisable unless the transfer is being applied to paper.

In the case of varnish or the maker's cement, which is a type of varnish, the transfer should not be laid until it reaches what is called a "tack," a condition of drying between wetness and top hardness. The actual time varies according to the varnish and the extent of thinning. If the transfer is laid while the varnish is wet it may sag out of position or easily slide from its place at the slightest touch. If the varnish is dried too far, the transfer naturally will not adhere properly.

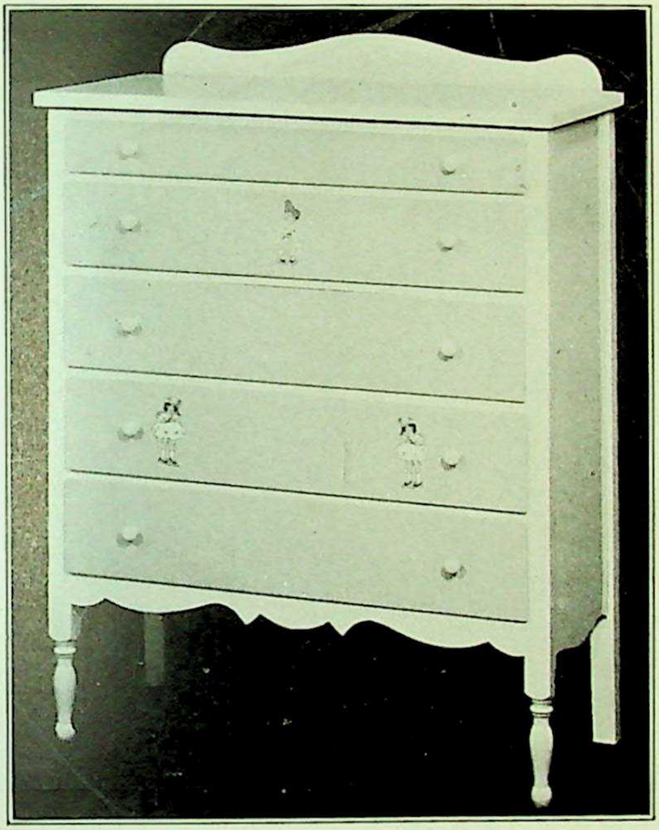


Plate LXX.—Juvenile Piece Showing Appropriate Transfer Decoration.

In laying the transfer great care should be taken that it be put on face to the surface, perfectly straight and firmly kept so while smoothing out. This may be done with the finger tips, a rubber roller of proper size, or for larger work, an ivory or bone smooth-edged letter opener, or for very large designs, a tightly packed and drawn pad of chamois skin. The danger chiefly to be guarded against is the appearance of bubbles beneath the paper once the transfer is laid; the best precaution is to put on one edge first, then roll or smooth carefully toward the other until the entire transfer is flat. On large transfers start at the center and roll one way, then the other.

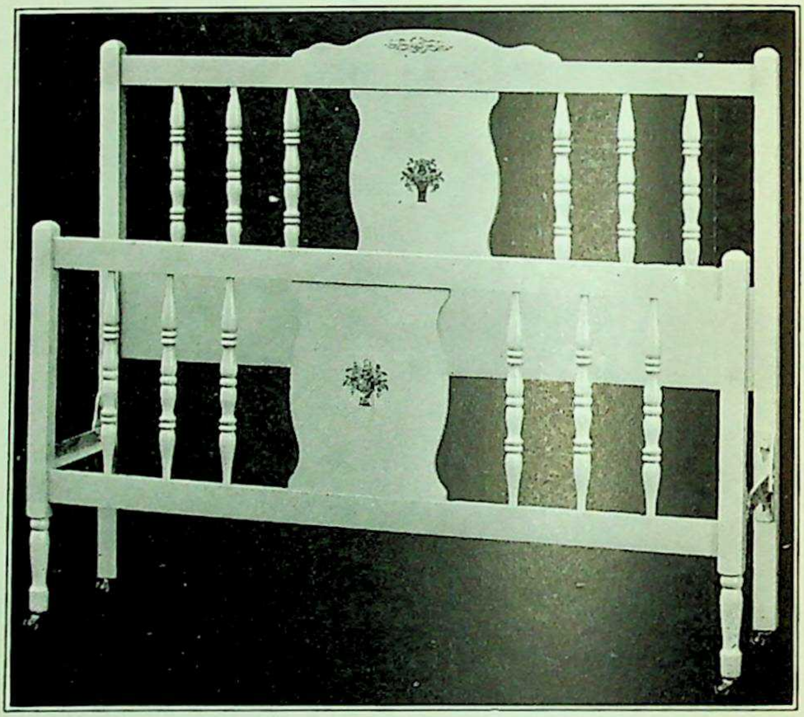


Plate LXXI.—Floral Transfers on Enameled Body with Applied Carving at Top.

## PRECAUTIONS

Bubbles and wrinkles usually result from an excess or improper type of varnish and must be got rid of by gently squeezing them toward the edge of the transfer. Where allowed to remain, blisters will appear and eventually the transfer pigment will crack and peel off. An excellent precaution is to dampen the surface slightly then roll on the transfer with a special rubber roller. After the transfer has been laid and smoothed out it should be left alone for from ten to twenty minutes at the end of which time the exposed back is gently sponged all over with lukewarm water, repeating the operation if necessary, until the paper readily peels or slides off, revealing the complete and unmarred transfer design. Premature lifting of the paper may lift part of the picture and excessive moistening may crumble the paper to a point where it has to be picked off piece by piece. If oil, varnish or paint is allowed to spot the back of the transfer the water will not be able to penetrate at these points. Upon removal of the paper the design will still be covered by a thin gummy film which should be wiped off as quickly and gently as possible with a clean, slightly moistened cloth. If allowed to remain the gum will dry and in contracting crack and curl up the picture. The rubbing or polishing of transfers once cleaned up in the manner described is not advisable; it should be left to dry overnight and remain untouched during this time. Duplex transfers have an extra top layer of heavy paper which may be peeled off dry before the moistening operation on the thinner underlayer.

## PROTECTION

While certain transfers do not require protection, it is best not to assume this unless so advised by the maker. Ordinarily it is customary to apply a coat of white shellac followed sometimes by a coat of pale varnish, which in some instances, is applied over the entire piece and rubbed down in the regular way. This will somewhat change the color of the transfer, but not infrequently the additional antique, softening effect is one to be desired. On many types of furniture an antique shading stain, preferably a spirit soluble aniline mixed in shellac, is purposely applied over the transfer as part of a general shaded coloring.

Where lacquer is used over transfers two methods are available, each of which will prevent bleeding or discoloring. A coat of white shellac, about 2 lb. cut, is first applied, followed when dry by lacquer which ordinarily will not penetrate through. Another successful plan is to apply first a very thin mist coat of the lacquer, allow it to dry ten or fifteen minutes, then follow with the regular lacquer coat sprayed on full strength. It is important in both cases that the transfer be laid tight against the surface, as raising or softening will occur most quickly on bubbles or air-raised spots.

# CHAPTER XVIII

## FREE-HAND PAINTING

DESPITE the remarkable advance in the artistry and genuine feeling afforded by decalcomania transfers, there are still signs of partiality on the part of a large number of manufacturers, particularly in the higher grades of furniture, for hand-painted decorations. For this purpose men and women are used, usually graduates of a school of applied art, and the amount of work they can turn out in a single week is truly remarkable, especially where a single design is being repeated.

Of course, not all furniture styles are suitable for hand-painted decoration, the prime purpose of which is to relieve with color and balanced form an otherwise plain background. Thus highly carved furniture or pieces replete with curves or offering very little flat surface are not adaptable, as this would be "gilding the rose," as the saying goes, and make for vulgarity rather than artistic interest. Thus a four-post bed, a rococco console or a massive Renaissance chair would be undesirable subjects, where a painted table, a pier bookcase, a severely designed panel bed or a large cabinet lend themselves to such treatment admirably.

### PROPER PLACING

In the case of painted furniture, the decoration is applied over the last coat of enamel after it has been rubbed out or over a flat coat followed by shellac or varnish. On natural wood finishes, the painting is executed on the shellac coat prior to varnishing, or over the rubbed varnish according to whether it is desired to protect it or not. The proper placing of the design is of course of great importance, since too small a decoration will be lost and too large a one will be out of proportion. Moreover it must be properly framed and set at a correct distance from the frame. If the shape of the panel or top is irregular and a small design is desired, it is customary to place it in a frame of its own. This may be a paint-striped circle, square, oblong or rectangle, which serves to emphasize it and apparently increase its size.

With painted furniture the coloring and design is usually bolder than with veneer background which has a decorative value of its own. Too strong a coloring or too bold a pattern would rob the wood markings of the attention they should share. An entire painted background, on the other hand, is too plain to stand by itself, and therefore demands something like hand-painting instead of taking it merely as a decorative auxiliary.

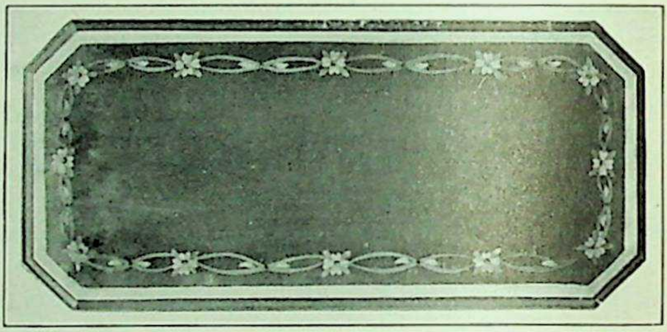


Plate LXXII.—Free-Hand Painted Border Design on Table Top.

## SUITABLE SUBJECTS

By way of subject floral groups practically monopolize the modern hand-painted choice of design. These may be sprays, running vine effects (for long surfaces), flower-filled baskets and urns ranging from nature's own ideas to severely conventionalized classic effects. Many of these may be secured from old chintzes, wallpaper, fabrics and still subjects in water or oil paintings. Polychrome work on legs, aprons, carvings, mouldings, etc., while hand-painted, does not fall in the same class and may be executed by ordinary finishing room help. On very large pieces it is often used in conjunction with the pictorial type in such a way as to harmonize closely with it.

Period themes and colorings may be grouped roughly as follows: *Gothic*—heraldic devices in scarlet, blue, chocolate, green and gold bronze. *Tudor*—vermillion and green profile medallions and the conventionalized rose. *Queen Anne*—dull blues, reds and greens with gold bronze in oriental designs. *Adam, Hepplewhite, Sheraton*—oyster white or light gray over black or light green over satinwood in classic medallions, plaques and Italian arabesques. *Empire*—Greek and Roman emblems in black and gold over gray, green or brown backgrounds on top rails and slats of chairs. *Early Colonial*—Flowers and fruits, scrolls and wavy lines in black, dark gray, blue and red on neutral painted or natural walnut and pine.

## LAYING OUT AND FILLING IN

The execution of a pictorial design is a process requiring artistic training, but up to the period of actual filling in with color, may possess a routine character. The experienced few can paint the subject free-hand from the beginning, but others would have difficulty in holding the design to exactly the same proportions and details on any considerable run of furniture unless the design is a very small, conventional one.

For large designs it is desirable to make a "pounce." Place the theme to be copied on an ironing board or other flat, padded surface with a piece of rough paper between and pin everything tight to the board with thumb tacks. With a thick needle or pin the outline of the picture is pricked at close intervals until it is reproduced on the paper by a myriad of tiny transparent holes. When applied to the piece of furniture these holes are dusted over with chalk for dark backgrounds and charcoal for light ones. With this done the design is ready to be filled in with colors by hand. For small runs the work can be done more conveniently by tracing the outline on a hard flat surface with architect's tracing paper. The design is then transferred onto the furniture with carbon paper and filled.

The real test of skill naturally enters with the filling-in operation, and here the training obtained in a good school with palette and oil colors is essential. It would be useless, therefore, to attempt here to give the procedure. Where no trained talent is available it is possible to secure effective results with simple one-color shaded designs working always with the original subject before the eye. A good striper could probably turn out very passable work of this kind in a comparatively short time, as a steady hand is one of the prime essentials.

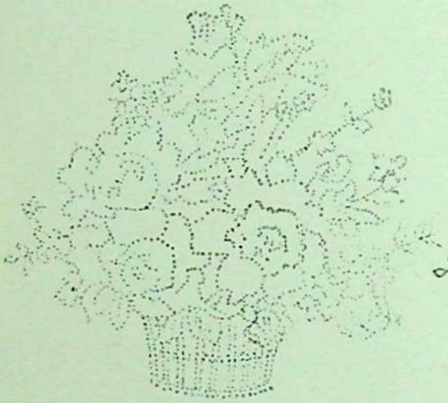


Plate LXXIII.—Pricked Outline of Hand Painting to be Dusted on Furniture (Pounce Method).

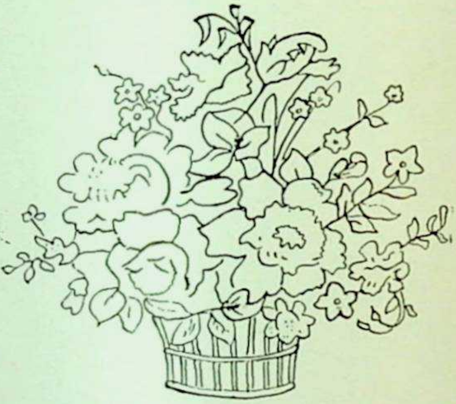


Plate LXXIV.—Tracing of Design to be Applied to Furniture by Means of Carbon Paper.

## GLAZING AND PROTECTING

Unless the artist is unusually experienced along these lines, it will ordinarily be found that the design when completed is too bold in coloring. To overcome and soften this harshness an antique glaze may be applied by hand as soon as the oil colors are dry, with or apart from any general antique shading of the piece as a whole. Such a glaze is applied heavily to the design, then quickly wiped off, thus leaving on it only enough to accomplish its purpose.

With the advent of lacquer some difficulty was encountered in applying the protective coat over the design in such a way that the powerful paint solvents it contains would not "raise" or crinkle the oil colors. As this occurred, even when the design had been allowed to dry apparently hard, attempts were made by artists to work with japan colors mixed in turpentine and oil and with dry colors mixed in shellac. But despite the resistance of these mixtures to lacquer, the rapid work rendered necessary with such quick-setting materials gave uneven artistic results.

Persistent experimenting eventually revealed that, in nine cases out of ten, by applying either a thin shellac coat or a mist coat of the lacquer, the regular full-bodied lacquer finishing coat could be put on in about an hour with complete safety. The decoration, of course, still had to be set aside long enough to become hard dry, but the delay proves in every way worth while. With varnish no trouble is encountered.

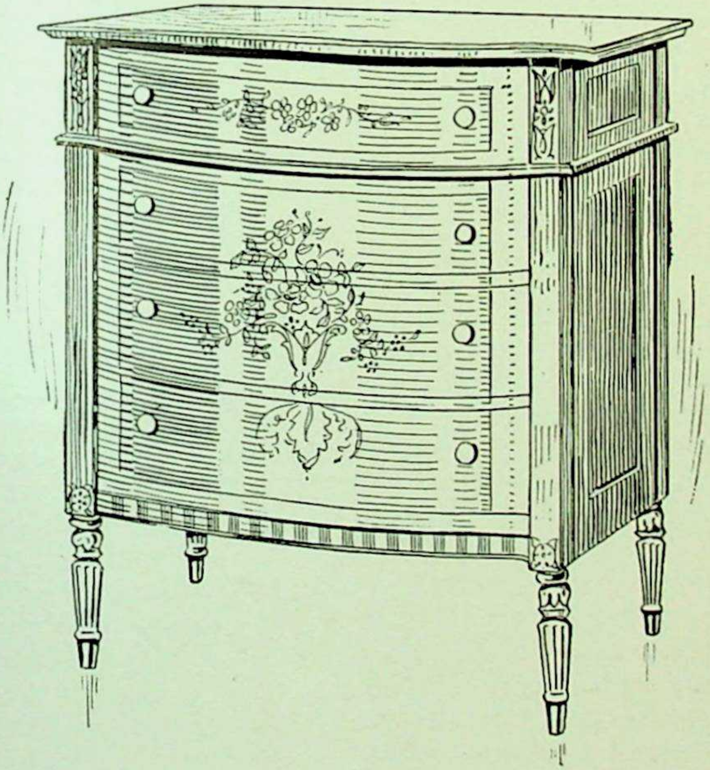


Plate LXXV.—Free Hand Painted Louis XVI Chest of Drawers.

# CHAPTER XIX

## ORIENTAL LACQUERING

ORIENTAL lacquer, which in no way resembles our own, having been in use for some two thousand years, is obtained from the sap of the "lac" tree, then thinned for finishing purposes with camphor or perilla oil. Like varnish it dries by oxidation, but unlike it, moisture hastens its drying—in fact, the Chinese artisan places the freshly coated piece in a damp cellar or humidity box overnight before putting on the next coat. The number of coats varies with the quality of the work, but twenty or thirty are not uncommon, each brushed on, dried as described and rubbed down—the final one polished to a high lustre. The resulting finish is extremely durable, since first, it is applied over teak, one of the hardest known woods, and second, there is no known solvent for it, being alike impervious to varnish remover, alcohol and ordinary acids.

### ORIENTAL AND MODERN LACQUER

It was toward the close of the seventeenth century that Dutch traders first introduced oriental lacquer to the western world in the shape of curiously decorated screens, boxes, chairs and small tables. Imitations of the so-called "Japan varnish" were soon forthcoming, consisting chiefly of shellac mixed with dry vermillion, chrome green, lemon yellow, bone black, etc. The art of application was called "japanning," and attained such wide popularity that a knowledge of it was considered a necessary accomplishment by young ladies of fashion. During the eighteenth century it was applied to all or part of much Georgian cabinet work—in fact whole dining rooms, walls, woodwork and chairs were made to run riot with vermillion paint and gold or silver decorations.

In our more scientific age many attempts have been made to adapt the original Chinese lacquer to modern production methods, but without success. Further incentive is lacking, due to the fact that our newly developed, quick-drying nitro-cellulose lacquers adequately serve all practical American purposes. Thus

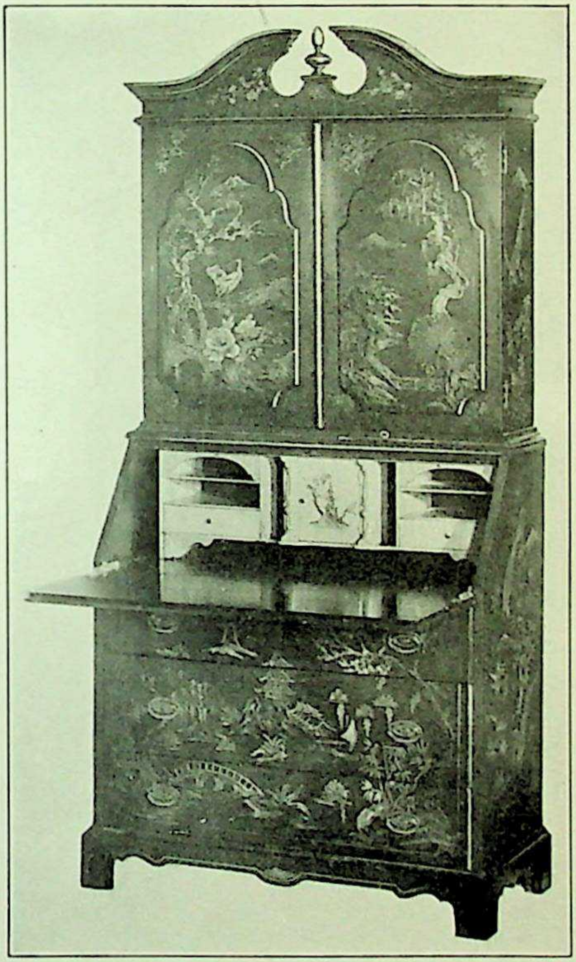


Plate LXXVI.—Oriental Lacquered Secretary, Showing Typical Design in Raised Figures.

lacquer to us means a speed of application which makes it possible to place the finished product in the hands of the many at a more moderate price; to the oriental it means painstaking craftmanship on the part of the furniture maker, great wealth and rank on the part of the owner.

### THE BACKGROUND COLOR

The first step in reproducing the oriental effect is the application of the body or background color which may be black (jet), red (an orange tone), green (lettuce or jade), brown (tan or chocolate) or yellow (champagne). For materials there is a choice of enamel undercoater, oil enamel, japan color and lacquer enamel, all of which may be used up to the point where the oriental decorations are to be applied. After these have been colored in or bronzed and antique glazed or stippled, flat or

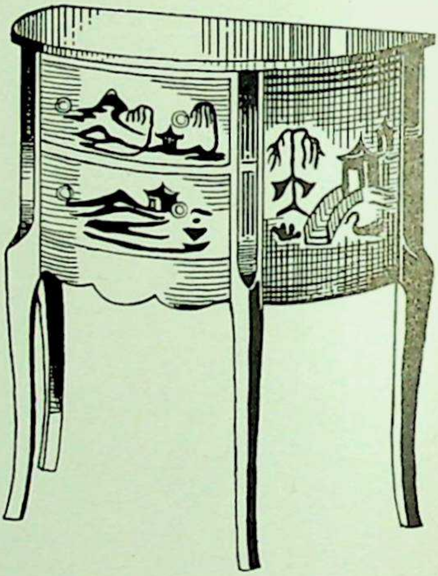


**Plate LXXVII.—Console Table of Modern Design Showing Oriental Decoration, in This Case Flat. The Color Scheme is Black on a Background of Green.**

rubbing varnish, flat or gloss lacquer may be applied as desired. It is also possible, of course, to follow the eighteenth century English method and build up with colored shellac coats, finishing with clear shellac over the decorations and rubbing, but this is not popular.

Where oil enamel is used three or four coats are customary, all of undercoater, sanded down smooth, or the last of oil enamel, semi-gloss or gloss, rubbed down. These materials may be brushed or sprayed. If the wood is so smooth as to require little filling, japan color may be sprayed, one coat being sufficient for all but very light shades. The oil enamel system calls for a three- to six-day schedule, the japan color, including clear varnish or lacquer finishing coat, one to three days.

## LACQUER ENAMEL

If production is a consideration, however, a complete lacquer enamel system is undoubtedly the most desirable. As with japan color, the wood should be close-textured, sanded to extra smoothness and primed with lacquer pigment first coater, since lacquer enamels do not fill to the same extent as oil undercoating. One coat may be applied each four hours, two to four coats being customary, with the last allowed to stand twenty-four hours prior to rubbing. If not desired to rub, flat lacquer may be applied as a finishing coat after decorating.

A background scheme for oriental decoration even more up-to-date than any of the foregoing is embodied in the spidery pattern of the new crackle finish. Yellow crackle over brown lacquer enamel undercoat, black over red, red or green over black, and black over gold or silver are appropriate combinations. A typical example of this system calls for one coat of lacquer pigment first coater, one coat black lacquer enamel, one coat Chinese red crackle lacquer, mottled all over with a sponge wet with a thin glaze of one pound each burnt umber and lamp black in japan to one gallon turpentine, followed by a thin coat of gloss lacquer, decorations in gold, yellow, brown and black and a top coat of flat lacquer.

## ORIENTAL DECORATIONS

So much for the background, which in method is more or less the same as for any cabinet work in solid colors. It is in the decoration that we have that part of the oriental idea that so strongly appeals to the occidental eye and in which the greatest skill is required. The subjects are familiar to us: dragons, peacocks, swans, ducks, deer and herons in the animal field; pagodas, waves, reeds, islands, mountains, trees, landscapes and human figures in characteristic costumes. In the manner of

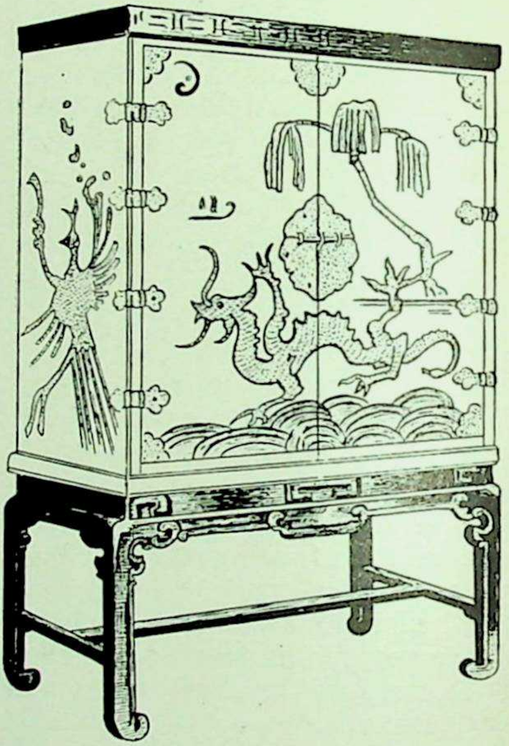


**Plate LXXVIII.—Wall Cabinet of Chinese Design Decorated in the Oriental Manner, and Finished in Modern Lacquer Enamel, the Base and Top Black, the Background of the Cabinet, Mandarin Red.**

application, however, we differ, for where the genuine Chinese or Japanese work is flat and very fine, ours is raised and somewhat coarser. Moreover, where we are satisfied with a single subject, the oriental artisan even on a large surface, fills it with myriad tiny pictures not necesarily related to one another.

In flat work we can resort to free-hand painting or even decalcomania transfers, but for the more popular raised figures the process is somewhat more complicated. First of all the design is prepared by tracing from or pricking through a piece of wall paper, a strip of chintz or a bit of Chinese embroidery. The tracing is transferred over a sheet of carbon paper on a light surface, or if dark, the pricked paper is used, dusting over tiny holes with powdered chalk or whiting. Once transferred to the background in one or the other manner, it is ready to be filled in free-hand.

## RAISED DESIGNS

Instead, however, of using ordinary oil colors, a stiff neutral-colored plastic material is applied. This is applied with a camel-hair artist's brush, layer on layer, a fresh one being added as soon as the previous one is dry, until the desired thickness is reached. While fresh and still plastic the paste may be worked to show details, but once it is dry, nothing can be done in this respect without the risk of chipping off a piece of the material. It is, therefore, important on the one hand not to have the mixture set too quickly for convenient manipulation, and on the other hand, not be so soft and slow hardening that it will run, mar or retard production. Good adhesion to the surface is also, of course, a primary essential.

There are various formulas for this relief mixture—most artists and decorators preferring formulas of their own. Popular in the general run of trade is so-called "iron filler," a ready-made piece of goods put out for the metal trades by practically all paint manufacturers. It is thinned to brushing consistency with turpentine. Others mix whiting, hot water and a little glue, or whiting and japan dryer, or whiting, pumice stone and shellac, or white lead, varnish and dryer. See also stipple paste formulas in Chapter XV.

### COLORING THE DECORATION

The next step is the coloring of the relief figures, which is frequently done with gold burnishing bronze and bronzing liquid or gold or silver leaf. Again they may be polychromed with thin glaze washes of black, brown, red, green or yellow japan color in turpentine, or painted solid and then picked out in bright spots of these colors according to the subject—the leaves of a tree, petals of a flower, feathers of a bird, eyes, hair ornaments, etc. Borders of striping, lattice or fret work are executed in harmonizing japan colors or silver or gold lining bronze and varnish bronzing liquid, the last over guide lines of yellow ochre or flake white in japan.

Over all of this and often on the background as well is applied an antique glaze coat of very thin burnt umber and Van Dyke brown and turpentine to soften the colors which glow softly through.

Lacquer shading stains may be misted on the background, applied with a spray, but shading on decorations must be done by hand for a real antique effect. The piece is then ready for the protective coats of flat lacquer, flat varnish, or gloss varnish or shellac to be rubbed dull, although with lacquer enamel on the background, these finishing coats are not always essential.

### THE STYLE OF FURNITURE

Strictly speaking, oriental lacquering and decoration should be confined to pieces of Chinese or Japanese design. In actual practice, however, pier bookcases, consoles, desk cabinets, china cabinets, end tables and novelty furniture of the most modern types of design are equally favored. Sometimes the entire piece is painted or lacquered and the oriental decoration applied only to a part. Again, a portion only may be colored and decorated, the remainder gold bronzed or finished in regular walnut stain and clear lacquer or varnish.

Note particularly Plate XIV, Chapter VII, Book V.

The radio cabinet illustrated is an example of the latter, and is Chinese Chippendale in design. The upper section is lacquered and decorated with oriental decorations of the raised type, the interior finished and decorated to match. The brass ornamental hinges are rubbed dull and the center half-round moulding is painted to match the panel background color and antique glazed. The lower portion is walnut, with burl centers framed with paint striping and hand-sawed aprons overlayed with blister-maple fretted tracery joining typical square, grooved Chinese legs. The whole is delicately spray-shaded and highlighted.

# CHAPTER XX

## METAL LEAF, BRONZE AND METALLIC IMITATIONS

THE art of gilding goes back to earliest antiquity, being mentioned in the Bible and extensively employed by the Romans and Egyptians. While the secret of their processes is very largely lost, in modern times several methods are open to us, the question of choice depending on the quality of work to be done. Thus, on high grade furniture carvings, picture frames, lamps, art objects, torcheres, wrought iron furniture and the like, metal leaf is used; on the same in popular-priced lines, bronze powders. Both are widely used in polychroming.

### METAL LEAF

Genuine gold leaf (22 carat) has a substitute, known as Dutch leaf, which is satisfactory where the work is not to be of the finest quality. Both come in sheets, put up in small books or boxes, interleaved with thin paper and are applied or "laid" over a "size." The make-up of the size is of great importance; the larger the surface to be leafed, the slower drying should be the size, because it thereby permits the entire work to be leafed before the size has become too dry. It is essential that size be applied only over a smooth, well sealed surface, shellac for wood and metal, whiting and glue for clay, "gesso" or composition.

*The Size.*—A slow or medium size is known as an oil size, being made from the fatty oil beneath skinned linseed oil, but its drying may be hastened to the desired degree by the addition of japan dryer. However, all sizes are best purchased ready-made for either slow, medium or fast work; for the latter, i. e., small work, japan gold size may be used. The important thing in applying the size is to have it absolutely smooth and put on *only* where the leaf is to adhere, if necessary using a pencil brush.

The question of when the size has reached the right stage of tack or stickiness is a difficult one to answer on paper. The general rule is overnight, but this presupposes that the size has been prepared for such a schedule. If still too wet the leaf may not stay in place, if too dry, breathing on it may help, otherwise it is useless to try to make it adhere. If not smooth, manifestly the leaf cannot lie smooth. Some gilders mix dry color in the size, chrome yellow under gold and white lead, lithopone or zinc oxide under silver, so that any discrepancies in the laying of the leaf will not show. It is necessary to keep such mixtures well stirred and only enough should be mixed for the work in hand.

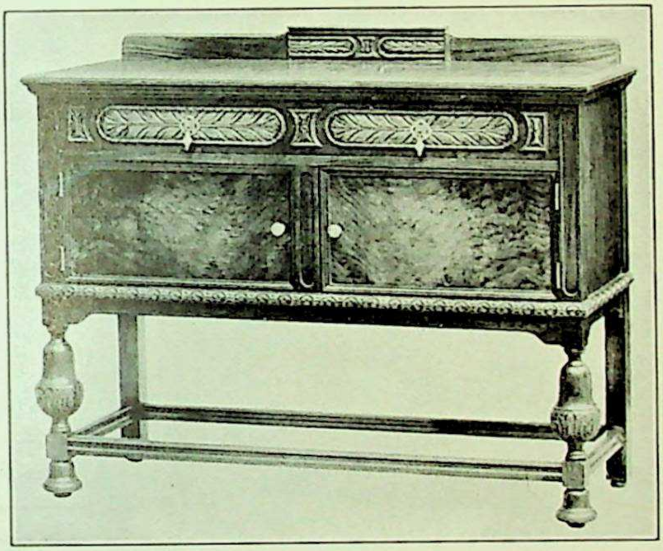


Plate LXXIX.—Walnut Server, Showing Gold-Bronzed Flat Carvings.

*Laying the Leaf.*—The actual laying of the leaf is delicate work, because of its extreme fragility; clumsy handling will break it and the operator's breath or a draft of air may carry it away or perhaps displace it on the work. The general method is to rub the special camelhair brush or gilder's "tip" on the sleeve or back of the hand to magnetize the hair, then with the tip lift the leaf by one corner and lay it on the tacky size; it will then de-magnetize so that it may be smoothed out with cotton wool if on a smooth surface, by stippling with a dry duster if on an irregular one. For small work cut the leaf gently to size with a razor blade before tipping on; such minute pieces are sometimes first wet with a mixture of alcohol and water to give weight.

The leaf will stick only where it overlays the sizing. Any laps should be allowed to remain until the size is hard dry, when the surplus pieces may be gently wiped or brushed off, these "tailings" being deposited in a box for future use. A new way of laying metal leaf is to cut a piece of waxed paper slightly larger than the leaf, rubbing it first with the hand to magnetize it. It is then placed over the leaf which will adhere, thus being carried to the sized portion of the work. This is especially convenient for round or shaped surfaces and the transparency of the paper enables the user to see exactly where the leaf is being placed. Once on, the leaf is smoothed out by holding in place with one hand and rubbing on the back with the other which will release the paper.

*Burnishing and Glazing.*—Once smoothed and trimmed, the leaf is ready to be burnished if high lights are desired, usually on corners, buttons and scroll edges. This is done with an agate tool, a sort of dental instrument which may be obtained from any paint supply house, but practice with it is advisable for the beginner, for not only must the leaf be smooth, but best results are obtained over a japan gold size and a hard surface. Watching an expert is undoubtedly one of the best ways of initiating oneself into the entire process.

Ordinarily, of course, metal leaf is not painted over—it is too expensive to hide. However, it is frequently antique glazed or spray-shaded as described in Chapter II, the work being done exactly as over paint and with the same materials. This serves to soften the metallic lustre and provide an aged effect, especially in crevices, but is naturally omitted from the burnished portions which are intended to catch the light. These high lights are thereby accentuated.

*Protecting the Leaf.*—While metal leaf will hold its lustre almost indefinitely, it lacks any real strength or resistance so that it is customary to protect with either a pale lacquer, applied over both leaf and glaze, or for work which cannot be sprayed or is too small, a thin pale varnish. These may be rubbed or left in the natural gloss.

## BRONZING

The use of bronze on furniture is confined largely to striping, carved decoration and polychroming, but is widely used on picture frames, metal and wooden art objects and lamp stands, especially where production is a consideration. The powders come in various qualities, graded according to fineness; the best are known as lining, striping or burnishing powders and stay in suspension, i. e., float well in the liquid vehicle; the coarser grades settle quickly and are mostly confined to use on radiators, bentwood chairs, etc. Bronze colors include every gradation of tone from pale to roman gold, and include as well copper, fire, blue, green, lemon, violet and a host of other colored metallic powders, mostly of interest to polychromers.

Next in importance to the powder comes the liquid which may be pale wood lacquer, thinned fifty per cent or more, or a good grade of coach varnish, reduced thin with turpentine. The former is best applied by spraying and dries very quickly, the latter may be brushed or sprayed as desired and requires usually twenty-four or more hours to dry hard. Both are most conveniently purchased under a brand name, the test of quality being their ability to keep the powder floating, their clearness, gloss and toughness. The body can be regulated according to the mode of application, a special reducer being required for the lacquer as recommended by the maker. Shellac is unsuitable owing to its tendency to "liver," and linseed oil, even with dryer, lacks toughness; no bronze powder should be purchased ready mixed in the liquid.

The proper way to mix bronze powders with the liquid is to sift the former into the latter, the general proportions being about a pound to a pound and a half to a gallon. The mixture should be stirred both in the preparation and at intervals during use, but the better the quality of each element the less settling there will be, and hence, less occasion to stir. It is best to mix up only enough for the particular job or day's work, as the tendency of the volatile thinners to evaporate may or may not be correctly remedied by the addition of further reducer. Uniform consistency is essential to uniform covering.

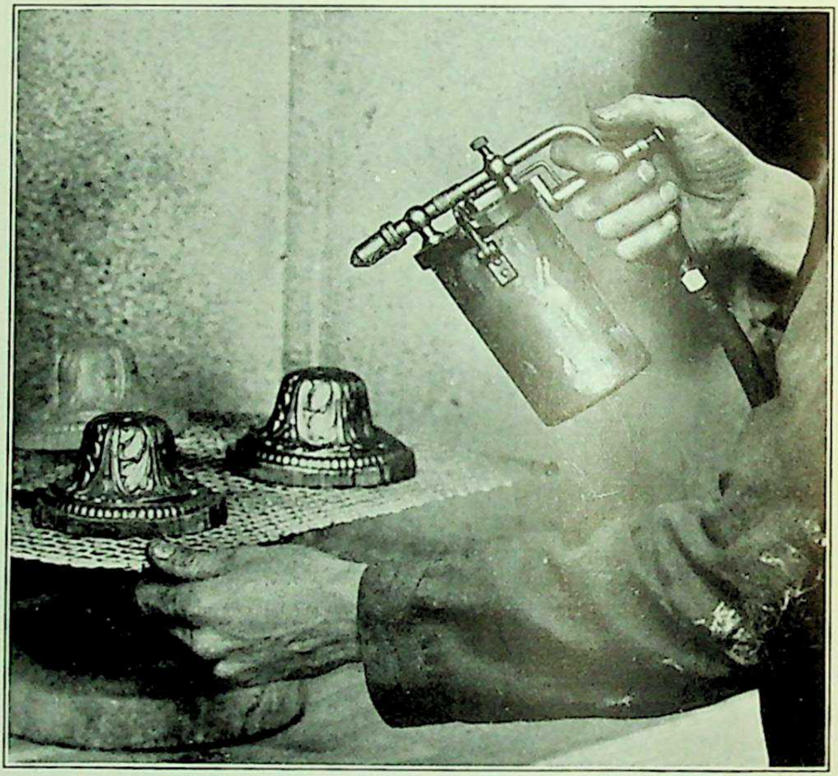


Plate LXXX.—Spraying Gold-Bronzed Lacquer on Gesso Lamp Bases.

Liquid bronze may be brushed, sprayed or wiped on with a pouch, may be antique glazed exactly as for metal leaf, and the finer grades of powder may also be burnished with an agate tool. If desired dry colors may be added according to the novelty effect desired. Like metal leaf, bronzes are best protected with a coat of clear lacquer or pale varnish and should be applied over a sealer coat of shellac, clay or "gesso." (See Chapters X, XI and XV, also Book V.)

*Bronzing Over Size.*—If desired fine bronze powder may be applied over size very much as leaf. A good size for this purpose is made up of a tablespoonful of raw linseed oil in a half pint of floor varnish, thinned slightly with turpentine. This is applied smoothly and when "tacky," gilded by rubbing over with a ball of velvet tied around cotton waste and dipped in the powder. The work is done gently but quickly with a circular motion keeping the pouch well covered with powder so as not to stick in the varnish. It is also possible to blow or sift the powder on the size while it is wet and completely flowed out rather than tacky, but a burnished effect is not obtained like the method above given. Different bronze colors may be used, or the gold may be antique glazed when dry for a novelty or aged effect.

### A VERNIS MARTIN FINISH

The Vernis Martin finish originated in France during the eighteenth century; "vernis" is French for varnish and Martin is the name of a leading coach painter who was the originator of the system. In this country the finish many years later was adapted to production methods and extensively used for metal objects, but is not so popular now as some twenty or thirty years ago. As a metal finish, however, it will always have use owing to the agreeable metallic lustre produced and the variety of effects obtainable with it.

*Small Work.*—On small work the first coat consists of a flat primer specially made for use on metal to be sprayed, brushed or dipped on and sanded lightly when dry to assure smoothness. Over this is applied varnish to act as a size which should be made for the purpose to air-dry or to bake. When this varnish has been applied and has flowed out smoothly, one or more bronze powders of extra fineness are blown on so as to cover the work uniformly. The powder should embed itself into the size so as to form a smooth finish, which when dry is protected with clear, pale varnish and rubbed dull or rubbed and polished.

*Large Work.*—On large work, such as metal bedsteads, the primer is dipped on and baked at the temperature and for the time appropriate to it. The varnish size is also dipped on whereupon the beds are removed by racks to a bronzing chamber where bronze powder is blown in through tubes to be whirled about and distributed evenly and thoroughly on the work by special fans. The size must be sticky enough to hold the powder but soft enough to permit the flakes to lie flat. Only a few minutes are required, after which the bronzed size is baked in an oven, smoothed with moss and given a second baking coat of pale clear protective varnish. Where the object does not permit the various coats to be dipped they may be sprayed, in which case the bronze powder is mixed with a varnish bronzing liquid made up so as to bake after application.

## OXIDIZED COPPER

This effect, which is alternate copper color and black, may be imitated with finishing materials by dipping the metal object first in a black gilsonite japan to be baked. When cool, copper bronze powder mixed in varnish bronzing liquid is sprayed on in an irregular pattern to imitate the genuine article, after which it is baked. Novelty effects may be obtained by substituting colored baking enamels for the black japan and using aluminum or colored bronze powders in place of the copper.

## METALLIC IMITATIONS

Occasionally it is desirable for one reason or another to duplicate metallic effects with paint rather than metal leaf or bronze powders. Most of these are the product of the ingenuity of some individual finisher and the methods are not preserved once the occasion for their use has passed. However, a few may be cited by way of example. A *gold* color may be mixed with dry japan or oil colors by adding to fifty parts white, five parts chrome yellow and one part vermillion; *copper,* to one 100 parts white, nineteen parts medium chrome green, three parts each Venetian red, raw umber and light chrome green; *brass,* to forty parts white, twelve parts light chrome yellow, one part each raw and burnt umber; *polished bronze,* to ten parts white, five parts raw umber and four parts light chrome yellow. All of these may be mixed thick and brush-stippled for a hammered metal effect or antique glazed for an aged appearance.

# BOOK IV

# Furniture Patching

# BOOK IV

## CHAPTER I

### THE ART OF PATCHING

THE art of patching damages to wood finishes has progressed from practically nothing to a high degree of development. It would be hard to give a history of this advancement, no matter how brief, for the reason that little record has been made of the progress of the art. It was considered a part of the finishing trade, and a minor thing in the early days of the development of the furniture industry. Very few books give any methods in patching, and what information is given is antiquated to a large extent.

Cabinet makers of the olden days filled all holes in the wood before they varnished with the sawdust from the same wood mixed with glue. It is supposed that they refinished a piece of furniture if it became sufficiently damaged. From the time of French polishing (seventeenth century) the only method of patching was to cut down a damage with glass paper and polish it to match the rest of the surface. This polishing was done with shellac principally, or a regular mixed French polish, as given in an old-time formula in a paragraph to follow.

A form of wood-turner's cement, developed in the eighteenth century, has undergone various stages of development up to the present time and become one of the principal materials for patching. From a form of sealing wax in sticks, it developed into a stick mostly of shellac, and has been introduced in all the shades of wood for cabinet room work and all the shades of the different finishes, including the bright colors, also transparent for the finishing room.

A process of bleaching shellac, to furnish a product known as French varnish, when the gum is cut with denatured alcohol, has been in use for some time, and is used extensively on varnish surfaces for building up spots by French polishing. This product has largely superseded both orange and white shellac for French polishing, and has particular advantages over shellac for this purpose. The method of application of this product will be dealt with at length in later chapters.

In the last twenty years the development in patching materials has undergone a great change or rather a great advancement. Burning in holes or indentations with cement, or French polishing with shellac, was all the patching done fifty years ago. Today we have numerous materials for patching different finishes, and yet there is need for improvement.

Each new finish placed on the market, with a wide sale and use, demands a special material for patching that will give good results with minimum delay. One of these developments is spirit enamel, for patching all enameled surfaces, with tinting colors made for it in order that the patcher may match any shade of enamel. This product will dry quickly and can be rubbed or frenched after drying. Amalgamaters, for frenching varnish surfaces and for flowing on a varnish surface to eliminate checks, are another development.

It has now come to the point of developing new materials for patching the lacquer surfaces. Different material must be developed for every known finishing material, and must contain materials similar to first finishing material, or at least not antagonistic to it. Some materials for frenching lacquer surfaces are now on the market, and it will come to the point of making a new kind of cement for burning in on lacquer pigment and clear lacquer coatings. A close touch with the material manufacturing companies, and especially those who make a specialty of patching materials, will allow the student or patcher always to keep in touch with every new material developed for his use, and with proper instruction and application, will keep him thoroughly posted and up to date.

It is useless to say that patching requires as much attention in the factory as finishing, for few of the pieces become damaged before they leave the factory, and if damaged in transit, it is up to the dealer to repair the damage and make claim with the transportation company for any damages in transit, but the kind of patching done by some men in factories is evidence of lack of instruction in this department and inadequate materials for patching. Some foremen believe that cement for burning in is all that is required, and if any frenching is to be done, shellac will suffice for this purpose. Of course many factories are well equipped for patching, but little proof is necessary that the finishing materials cannot be depended on for patching, and few will admit that they can patch any kind of damage with the assortment of materials to be found in the average finishing room. The following chapter will enumerate and describe the necessary materials for every kind of damage to any finish.

The present method of eliminating damages to lacquer surfaces is to sand down the damaged place and spray over the surface again with the last finishing material and repeat this as often as necessary to build up a level finish and feather it down with the wet sanding process or rubbing with pumice stone and oil. It is admitted that this probably is the best method to use in the factories where the same material is to be had without mixing or matching, and the damage can be noticed at once before another coat of material is sprayed on, but under different circumstances, and where most patch work must be done, the same conditions do not exist and the same materials, and especially the exact match, are not at hand.

Small spray patching outfits are obtainable from the different manufacturers, and the outfits are designed for use with many cups of different material. If one has sufficient patching for lacquer surfaces, both clear and opaque and of different colors, it is an advantage to have one or more of these outfits, for their utility is indisputable. A mixture of a clear lacquer with japan colors could easily produce the right effect if sprayed on a spot, provided the color was exactly matched. This matching of the color is the one bad feature of such methods, for one cannot add color to the work gradually, as one would do with the French polishing method. This process will be described later on.

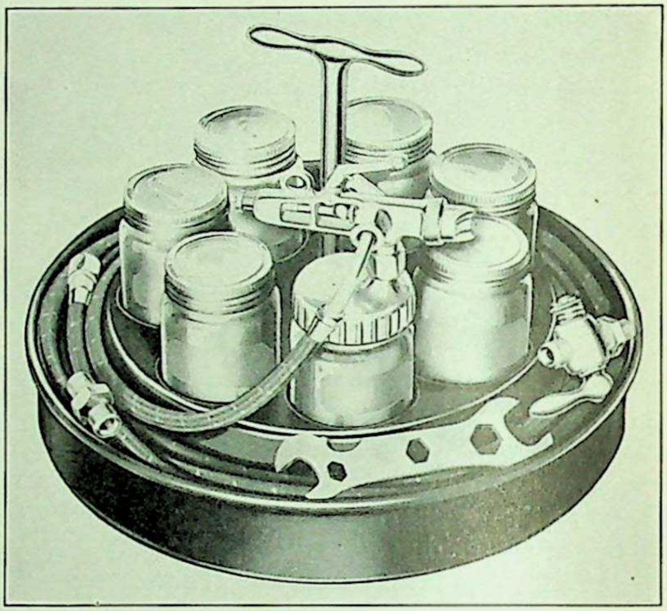


**Plate I.—Showing Spray Patching Outfit. This Outfit is Recommended Where Compressed Air is Available.**

All the clear, transparent finishes, showing the grain of the wood, allow an easy way of matching color by frenching and adding color gradually. Any part made too dark can be camouflaged by making an apparent grain in the surface. This cannot be done when matching solid color surfaces, such as enamel or lacquer, but must be an exact match to avoid detection of the patch. Few men can make a perfect match of this kind without the original material, and even then it requires a different tone to match perfectly, so it becomes necessary at times to patch the spot first as nearly as possible and then apply a light finishing coat of a very near match over the entire surface that was patched.

The decorative finishes are very difficult to patch, depending on the nature of the damage and the kind of finish you are patching. The latest instruction in this line will be found in Chapter VIII of this section, and will help the finisher eliminate much trouble when attempting work on this kind of finishes. Another thing to remember is that one man cannot easily patch a finish unless he understands what kind of material is used to make up the finish and the way it was applied. If this knowledge is available to the one trying to patch the finish he has a great advantage, because he will know just how each material will react on the finish when he applies it and whether he must use oil, lacquer, or spirit patching materials for that particular finish.

To sum up, patching of damages was once the job of the finisher who applied the first materials, and no special man was trained for this particular kind of work. Now every factory has special men for this purpose, called patchers, and in piano factories they work on a piece-work basis, in many instances, with a stipulation of so much for patching a case, no matter whether it has one or twenty damages.

It is now customary to have different men for each kind of patching. A man for burning in; another for French polishing, and others for rubbing, etc. Even the large retail establishments follow this method, and of course gain more in efficiency from constant practice on a certain kind of damage. This method allows for specializing, but does not allow the perfecting of a man in all the different operations. If one intends to follow patching as a vocation, it is well to acquire a knowledge of all finishing operations first and then pick up the simple operations in patching, eventually becoming an expert in every branch of patch work.

Advance in material manufacture for this patch work is equally important, and this, of course, always lags back of any new development in finishing material. Time must elapse from the advent of any new material until its success is assured before the patch material manufacturers will start to develop a material suitable for patching such a finishing material, and when a material for patching this kind of finish is developed, a certain amount of educational advertising must be done, in fact, a great deal of educational work must be done before the finishers and patchers will break away from tried and true methods to adopt a new way of patching.

A sure method for anyone to adopt, whether they be superintendent, foreman, finisher or patcher, is to try everything in spare time as fast as it appears on the market, and thus be up to date as to material.

# CHAPTER II

## THE PATCH WORK KIT

A LIST of materials for patching can be made long or short, according to one's desires as to completeness, and as to whether one enumerates materials generally regarded as finishing materials. We will confine the list, for the most part, to materials used exclusively for patching, and only name such necessary materials as are commonly used in finishing but needed for patching.

Most patchers have a kit designed to hold such materials as are regularly needed for patching the most common damages. This kit is usually made in such a way as to allow opening with every material in a handy position for immediate use without disturbing the other material or tools. (Many such cases are now on the market, and in fact thousands of them are in use.) Not a day passes but many homes are invaded by "complaint men," who follow up deliveries of furniture to repair slight damages to the finish made in transit. The day is past when an up-to-date house will allow a man to drag into a home a heavy tool-chest or an ordinary satchel, from which he will extricate a conglomerate mess of bottles, cans, and tools, covered with stain and what not, with all labels and distinguishing marks obliterated, and strew them all over the furniture, floor, and even the carpets.

To say the least, such a method is a poor advertisement, but the worst part is the delay in assembling the proper tools and material for the repair out of such a mess. Add to this the danger of spilling material, the anxiety of the housewife, the frequent use of wrong material by mistake, and it is to be hoped the cause for an up-to-date kit is won.

## MATERIALS FOR A KIT

An easy frenching material, such as an amalgamater for varnish surfaces, and another, called French varnish, for building by frenching, will suffice for frenching. One needs a rubber or sponge for use with these materials, as well as some light oil for lubricating the pad.

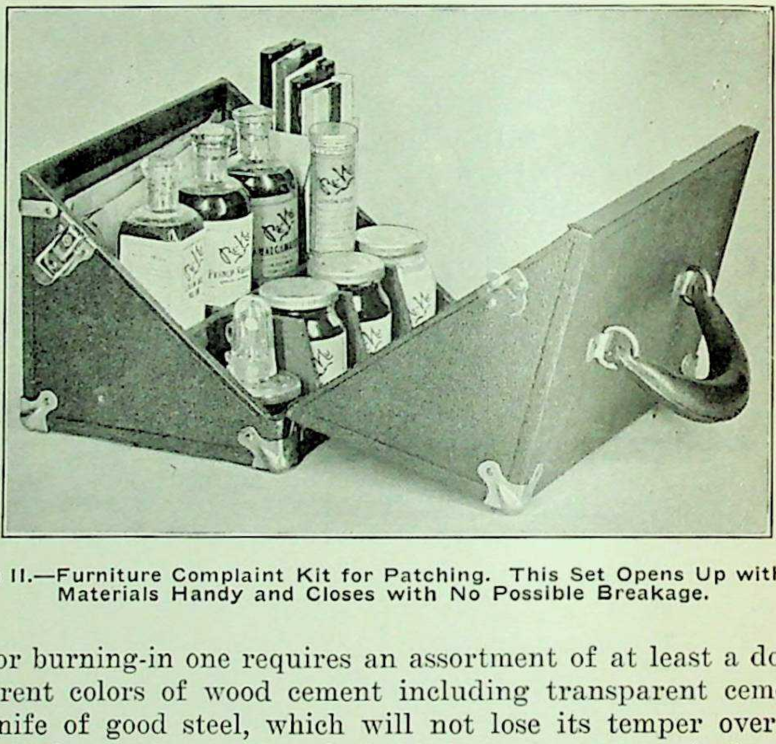


**Plate II.—Furniture Complaint Kit for Patching. This Set Opens Up with All Materials Handy and Closes with No Possible Breakage.**

For burning-in one requires an assortment of at least a dozen different colors of wood cement including transparent cement. A knife of good steel, which will not lose its temper over an alcohol flame, about a four-inch blade, not over one inch wide and beveled at the point, is needed to apply the cement. Of course an alcohol lamp or torch to fit the case is also necessary.

At least five or six small cans or jars of aniline stain spirit soluble are required. The following colors are suitable: American walnut, Bismarck brown, brown mahogany, golden oak, nigrosine, and some yellow and bright red. All of these should be spirit soluble. These jars or cans of stain should be of a convenient size to fit into partitions or clamps that are easily accessible. The lids of such containers should be easily removed and replaced to assist in quick work and to provide for a clean kit to prevent spilling materials.

An assortment of abrasive paper, garnet paper in grades from 2/0 to 7, cut in pieces one-eighth of a 9x11 sheet in size is needed; also some 2/0 steel wool and FFF pumice stone. A small amount of parafine oil or polish must be included for polishing and rubbing.

Few tools are needed, aside from those mentioned in the paragraphs above. Some recommend a scraper for leveling down cement. A scraper is made from tool steel about six inches long, one inch wide and about one-sixteenth inch thick. The edge is sharpened square on each end. Woven felt, one-quarter inch thick and cut in pieces 3x5, is needed.

Primarily the above mentioned tools are all that are needed for a kit, if one is considering the use of the kit for patching alone. If you expect to equip the kit for repairing also, you would add such cabinet makers' tools as a small keyhole saw, block plane, screwdriver, tack hammer, etc. These may be used in repairing furniture in homes and are essential for complaint men working for retail establishments. Of course a striping brush and lining brush, with one or two penciling brushes, could be added, and above all, if dulling is necessary after patching, a rubbing brush should be included. Any stiff bristle brush may be converted into a dulling brush by cutting off the bristles reasonably short and square to the sides of the brush.

An unusual amount of materials are used in patching, including about all the materials commonly used in finishing, besides an assortment of quick-drying materials not used in finishing, but adapted for patching. It will not be necessary to mention all the materials that are used in patching, and especially the finishing materials, but we must enumerate all the patching materials needed at regular intervals and found in a complete kit.

## FRENCH VARNISH

French varnish is a refined shellac gum cut in alcohol, and the quality of the product depends on how soon the gum is cut up after being bleached and refined and the amount of filtering done afterward. This product is sold under more names than almost any other product used for patching. It has various trade names such as "etheral varnish," "French lacquer," "quick-drying varnish," and many other names, but all of the same base, with slight variations to hide the identity, or make it individual for each manufacturer. A standardization would benefit all concerned and eliminate many misnomers.

Another name that has come down for several generations and still persists is: "French polish." Originally this name meant the concoction of a formula as follows:

Gum sandarach, 14 oz., 2 drachms
Gum mastic in drops, 7 oz., 2 drachms
Shellac (the yellower the better), 14 oz., 2 drachms
Alcohol of 0.8295 spec. gravity, 3 qt., 1 pint

"Pound the resinous gums, and effect their solution by continued agitation, without the aid of heat. Before using, the wood should be made to imbibe some linseed oil, the excess of which should be removed by an old flannel."

The above original recipe, as first invented, is taken from a French work, the *Dictionnaire Technologique,* not, however, for its usefulness (as it has not been in use for many years), but as a matter of curiosity.

The use of refined shellac gum, benzoin, and linseed oil, in different proportions, is yet to be noted in many sections among the older craftsmen, but the younger men prefer to buy their French polish in the form of an amalgamater, or French varnish, and thus save all the time necessary to make up such a formula as above and yet have a better product. Time is too valuable to waste it in making up formulas in small lots for individual use. With all the amalgamater and French varnish to be had at reasonable prices from supply houses, little excuse can be given for wasting time in making up anything. Nothing can be gained by sticking to an old material when something new is demonstrated to be better and quicker. Quality first and then consider time-saving and ease of application.

### AMALGAMATER IN FRENCH POLISHING

This product is one that is destined to supersede French varnish for frenching out light abrasions in the finish. Already it is preferred wherever it has been used to any extent, and even though it is opposed by some who prefer to stick to the old materials, every year finds an increasing sale for this material.

Nothing for sale today in the line of frenching materials, can be used as easily and cover as large a surface without the usual streaks, and that without the use of oil on the rubber. The popularity of amalgamater is due to the fact that it can be used on any kind of finish, even by a novice, after a little practice, and will leave a clear, hard finish that is durable. Even when French varnish is used to build up the surface, amalgamater should be used to finish, in order that the finished surface be firm and free from rubber marks.

Amalgamater, as the word implies, draws together the surface of the finish and combines all the materials into one resilient, yet firm, hard finish. The gum used in this product is imported from the East Indies and is used to a large extent for perfume, hence the delightful odor in opening a container of genuine amalgamater. No other gum has the same quality of rubber-like consistency and ability to congeal with all varnish and lacquer finishes. It will smooth over a finish, at the same time moving the undercoat without the slightest indication of sticking to the finish unless the rubber is deliberately stopped on the finish. Do not think that all the products bearing this name are the same, for some are intended for brush use and not to be used for frenching. A full understanding of each particular amalgamater should be had before using it, and comparison is the only rule for deciding as to which product to use. If you wish a product for frenching, be sure to secure one recommended for that purpose.

French varnish and amalgamater are the only materials necessary for French polishing, except some light oil, like furniture polish, for use on the rubber to prevent sticking. In the olden days the use of linseed oil on the rubber was the thing, but today a light oil (some use lemon oil) is preferred. Linseed oil will congeal with a shellac product and delay drying. The other mineral or vegetable oils come to the surface and allow quick drying of the surface underneath.

### WOOD-TURNERS' CEMENT

This product is known under the following names, which are synonymous: stick shellac, finishers' wax, stick filler, etc., and even sealing wax, formerly used to seal tin cans. To be of good quality this product should contain at least fifty per cent shellac, but few of those on the market contain this percentage. Most of them are made principally of different resin gums with addition of shellac in varying proportions. For coloring, both aniline and pigment colors are used. For the lighter sticks, in oak, white or ivory and different greens, reds, etc., pigment is used, but generally in the best cements, oil aniline is used for coloring matter. These are termed transparent sticks, for the reason that a light, thin application will result in the grain of the wood showing through.

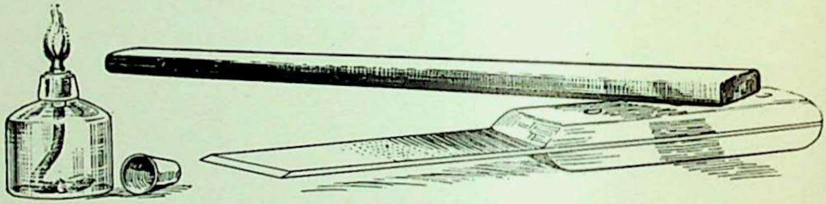


Plate III.—Knife, Lamp and Stick Filler.

For convenience these sticks are made about six or eight inches long and about one-half inch thick and wide. They are always applied by melting on a hot cement knife (burning-in knife) and either spreading or running into the crevice or indentation, and then smoothing down with the knife while hot.

Alcohol torches or lamps of various sizes can be used, but for the kit it is well to have one not larger than four ounces. Obviously it would be better to have a metal lamp, preferably brass, to prevent breakage. The knife is held over the lamp and the cement is applied to the upper side of the knife until melted.

### STAINS FOR PATCHING

Spirit soluble aniline dyes are the accepted stains for patching damages and are the only colors recommended in this work where French polishing is employed for repairing or patching spots. Water stains in certain instances will be referred to and recommended, but only where it is impossible to use spirit stains and a rubber for application.

As mentioned before, five or six colors in spirit stains are needed in a good kit for the complaint man, but more than this number could be used in the finishing room where patching is done on a large scale. The following list, with explanation of adaptation to different finishes, will help in their selection.

*Bismarck Brown* should always be in the list for use on all mahoganies. This color has a deep red shade, and can be had with a clear red tone or with a yellow tint.

*Walnut* is a mixed dye, usually a combination of red, black and yellow, and can be had in many different shades with a reddish tint or greenish shade. A straight brown is more useful if one only is to be selected.

*Nigrosine* is obtainable in jet black or blue black, the former being the one mostly used in wood finishing. This stain is used extensively for shading other colors.

*Golden Oak* is a mixed dye of a straight brown that can be made to appear dark or light by the different amount used, especially when applying with a rubber. This color is sometimes used on walnut or mahogany in patching.

*Auramine* is a spirit yellow used for tinting the above colors in order to make light shades of brown. Used with nigrosine, it will give green.

*Brown Mahogany* is not used much of late. It is a dark brown with a reddish tone. A mixed dye.

One could mention blue, yellow and red and have all the above except nigrosine included, but it is best to buy aniline stains by the name of the finish to be patched and then the difficulty of matching will be reduced to a minimum. Orange may be used in certain instances, but if one has a bright red and yellow, the orange is a matter of mixing, and for the few times that this color is used, the mixing would be far better than the purchase of color seldom used.

### ABRASIVES

Abrasives are discussed fully in connection with finishing. There are a few instances, however, where the abrasives used in wood finishing cannot be used in patching. The use of waterproof garnet paper is taboo in patching and few coarse garnet papers are used. A good garnet finishing paper, either double-faced or single-faced, of grades from 4/0 to 7/0, suffices for all patching. Flint paper is not used in patching to any extent because it is not durable and the cutting surface is easily dulled.

Pumice stone, no coarser than FF, and usually FFF, is used. The Italian pumice stone is recommended, and it should be American-ground and kept in a dry, clean place. Domestic pumice stone contains fine grits that will cut up the finish and leave deep scratches that are hard to remove.

Steel wool of the finer grades only is used. The grades from 0 to 3/0 are used for smoothing down lacquer surfaces before patching. This steel wool is turned from steel, and not made from scrap as is supposed by many. Careful grading results in a uniform package of threads of the same size.

### RUBBER (PAD, SPONGE, ETC.)

The wad of resilient material with a smooth surface underneath for spreading varnish is called by a number of names. "Rubber" or "sponge" is correct, for it is both a rubber and a sponge. To make the right kind of rubber for frenching, select a piece of old muslin (a piece of sheet or pillow slip which has been discarded) twelve or fourteen inches square, folded twice, and inside this place enough waste, cheese cloth, or cotton batting to make a ball at least two inches in diameter. Catch up the ends of the outer cloth and draw tightly together, and if necessary, tie a string around the ends to hold in place. A patcher usually allows the ends to be loose so that he may place fresh material inside when wanted.

Above all else these rubbers should be kept in an air-tight container, and if one only is carried in a kit, it may be enclosed in a jar or can with a tight cap so that it will always be ready for use and of course soft. Once the pad gets hard from the drying of material on it, discard it and make another. The older the rubber gets the finer the work, because the pad is worked down to a smooth surface. Many patchers who work in the shop most of the time, supply themselves with many pads for different work and keep them in a large receptacle.

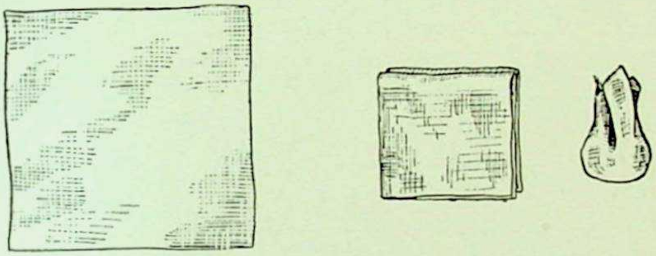


Plate IV.—A Rubber for French Polishing.

### KNIFE, LAMP, SCRAPER

Two different kinds of knives are used, mostly made by the patchers themselves. One is a stiff-bladed knife, made from saw steel and well tempered. These knives will stand all the heat a torch or lamp will supply and yet hold their temper. Furthermore they will hold the heat longer than a thin-bladed knife and thus allow longer work with the knife than the thinner knives. The stiff-bladed knives are about one inch wide and four inches long from the ferrule to the tip, and the end is usually cut on an acute angle and beveled to allow easy access to panels, etc. See Figure 111.

The other knife or spatula in general use is made from thin steel and generally of such quality that the heating of the lamp will take out the temper so that the knife is no longer flexible.

Alcohol lamps and torches are obtainable in various styles and materials. A brass lamp is the safest to use in a complaint kit, although glass will suffice. These lamps vary from two ounces to eight ounces, and have a round wick which can be covered by an air-tight stopper, or cap, to prevent the evaporation of the alcohol.

Electric heaters for heating the cement knife give varying results and as yet seem to be in the experimental stage. They are made to use on direct or alternating current, but must be selected for 110 to 220 volts.

A steel scraper is used for shaving down the wood cement after burning-in. The scraper is a straight piece of tool steel, about six inches long, cut off square at the ends. The sharpening is done by grinding the ends smooth and merely grinding the sides to take off the roughness. It is not sharpened like the bevel edge of a plane knife. It is merely smoothed off so that when the square edge is passed over the cement it will shave off a portion of the cement without cutting into the surface, as would be the case if the edge was sharpened like a knife. An ordinary scraper would suffice, but it is too wide for leveling cement. The scraper should not be over one and one-half inches wide and about one-sixteenth inch thick.

### FELTS FOR SANDING OR RUBBING

Several pieces of felt, woven and pressed, should be carried in the kit. One piece, about one inch thick and twice as wide, and about four inches long, suffices for a sanding block and rubbing with pumice on all flat surfaces. Another piece of one quarter-inch material and about 3x5 inches in dimensions must be in the kit for rubbing all rounding surfaces, etc. The cork block referred to in wood finishing for sanding is useful.

### BRUSHES FOR PATCHING

The illustrations below show the number of brushes that can be actually employed in patching and finishing of patched surfaces. Plate V is a rubbing brush for dulling inaccessible surfaces; some of them are reversible so that one end will not outwear the other.

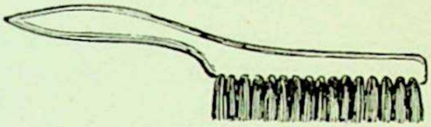


Plate V.—A Rubbing Brush for Dulling Inaccessible Surfaces.

Plate VI shows another brush designed for dulling straight-

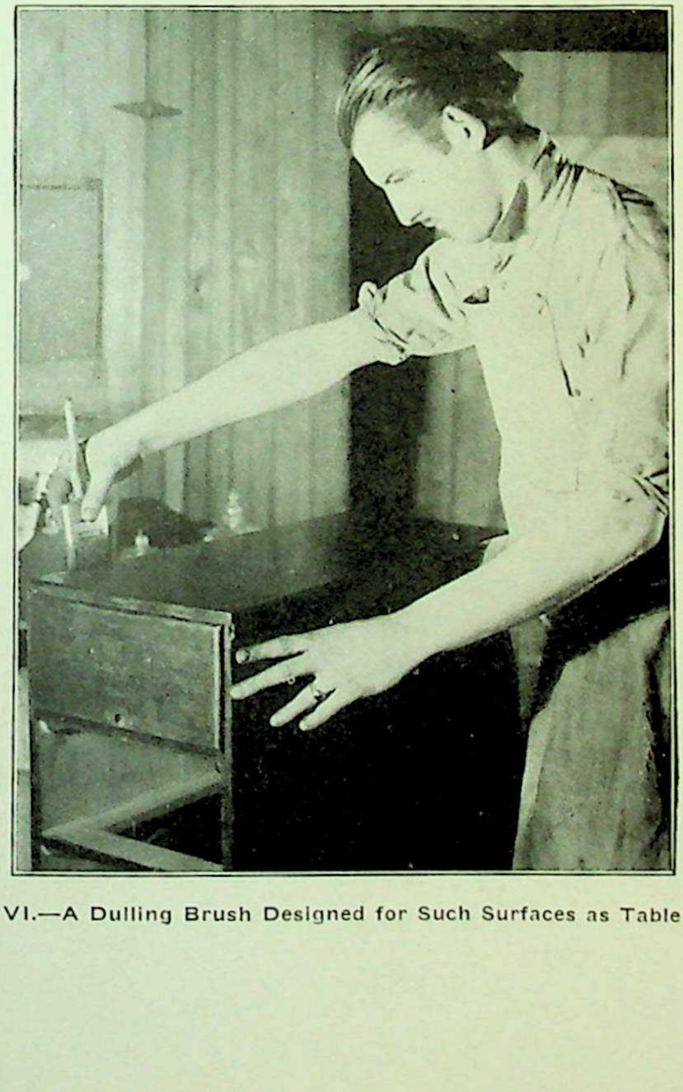


Plate VI.—A Dulling Brush Designed for Such Surfaces as Table Tops.

away surfaces like the top of a table, and differs from the average stiff bristle brush only in the length of the bristles and the stubby ends of the bristles.

Plate VII.—A Penciling Brush Used for Touching Up Inconspicuous Spots.

Plate VII is the average penciling brush used by patchers for touching up inconspicuous spots with stain or French varnish. They are very inexpensive. Swan quills can be used for this purpose and are shown in Plate VIII. These are also used for striping.

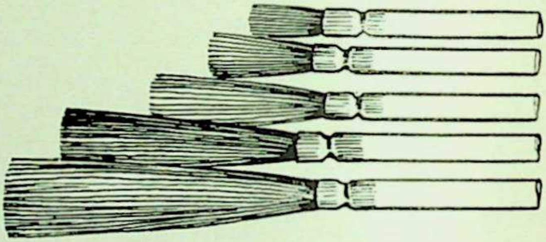


Plate VIII.—Swan Quills, Used for Touching Up and Also for Striping.

In Plate IX you will notice dagger stripers that are of different sizes. This one represents a brush about 4 inches long. These brushes are preferable for striping where a line must be laid on flat surfaces and a straight-edge can be used. The lining

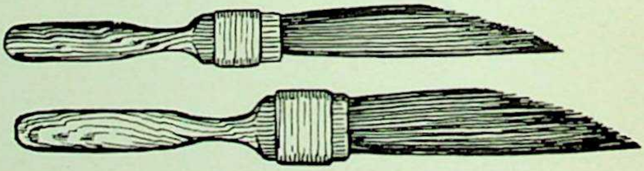


Plate IX.—Dagger Stripers, Preferably for Striping Where Lines Must Be Laid on Flat Surfaces and a Straight-Edge Can Be Used.

brush, as shown in Plate X, is purposely wide for filling in in wide stripes, and very valuable for other work in patching.

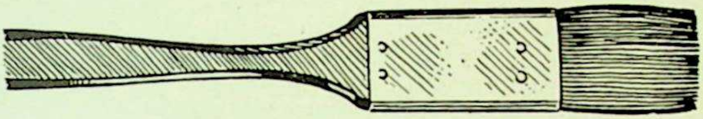


Plate X.—A Wide Lining Brush for Filling in Wide Stripes and Other Work in Patching.

## MISCELLANEOUS MATERIALS

One should have two shades of gold bronze, and a selection from the lightest and the darkest shades allows the matching of any gold bronze finish by mixing these shades; also a small jar of bronzing liquid for a size and some bronzing lacquer for a protective coat. The bronze is carried in small vials or envelopes and the liquid in small screw-cap jars which are airtight. In special instances aluminum or silver bronze can be used, and in rare instances, burnishing bronze must be used. In the latter case an agate burnishing tool must be used.

Spirit enamel in white only must be in every complaint kit, with five tinting colors for tinting the enamel for any color. These tints come in yellow, red, blue, green, black, etc. The tints can be kept in small vials, as little at a time is ever required. The white spirit enamel is kept in a jar with a screw cap so that it is easily accessible.

In patching lacquer surfaces, some clear lacquer or a jar of white lacquer, like the one of enamel, and a similar line of lacquer tints should be included. The application of lacquer to so many pieces of furniture today requires that this material be included in all kits that are up to date.

# CHAPTER III

## REMOVING PACKING MARKS

FOR many years the bane of existence of the retail furniture dealer has been packing marks. Soft varnish, the result of the manufacturer sending out pieces on which the finish was not sufficiently dried, is the cause. Even if long-time drying was resorted to, in the summer months in the temperate zone even the heat softens the varnish to the extent of marking under the slightest pressure. At the present time better crating and the use of lacquer instead of varnish has largely eliminated the packing marks from the better grades of furniture, and musical instruments are packed with the intention of entirely eliminating them.

If all light pieces of furniture are swung in the crate, instead of pressing a pad against the surface where the crate touches, these marks will be largely eliminated. Wax paper is used in covering most pieces before crating, and of course this helps, but the secret seems to have been discovered by the manufacturers of phonographs. The frame is built in such a manner as to brace the machine in the box. Either waxed blocks or felts are the only thing that touches the cabinet and the wax remains cold (having a melting point of about 130° F.) and forms an excellent cushion between the wood and the finish.

### MATERIALS TO USE

In the case of very light packing marks, use FFF pumice stone and oil. If the marks are deep, use a rubbing block of felt and 5/0 garnet finishing paper and oil for surfacing and amalgamater for frenching with the rubber. One must decide if the marks are just a slight impression, before using the pumice rubbing method, for you must consider that you cannot rub through the finish, and if the marks are through the last coat of finish it is better to French polish the surface.

### SURFACING PACKING MARKS

In case the impression in the finish is light enough to allow rubbing out by passing the felt over the surface a few times, dip the felt in rubbing oil and then in FFF pumice stone and rub with the grain very lightly, no more than a dozen times over the spot, being careful to feather out the rubbing past the spot, at least four inches each way. If the spot appears a little dull compared to the rest of the finish, use another felt with rottenstone and oil and polish to match the rest of the surface. Most of the finishes at this period are either dull or satin finish, but occasionally a high polish is encountered and in this case it is best to French polish.

If the marks are to be French polished out and they are fairly deep, use either a felt or cork block for holding the garnet paper, and with 7/0 paper on which you have applied some oil, sand the surface lightly with the grain until you have cut the high places down about level with the rest of the finish. Be careful not to sand the surface down to the stain, as this causes the most difficult patch in transparent finishes. Few packing marks are deep enough to go all the way to the wood; if so, refer to Chapter V, for instruction on filling.

After rubbing the surface down with pumice, if light marks, or sanding down the finish with garnet paper, clean off the finish with benzene and wipe dry, and begin to french the surface.

### FRENCHING OUT PACKING MARKS

Taking the rubber, previously described, and after applying a small amount of lemon oil, apply amalgamater, or similar product directed for use in removing the finish. The amalgamater must be applied from the bottle to the surface of the rubber and then the pad or rubber pressed into the palm of the other hand. This spreads the liquid on the surface of the pad, making an even application to the surface. Begin the frenching of the surface on the spot sanded. Right here is a good place, and packing marks a good damage, to begin the proper use of the rubber. It is easier to learn its proper use when actually working on this kind of damage, where the results are quicker, than on some of the other damages described in later chapters.

### USING THE RUBBER FOR FRENCHING

Begin immediately to make circular motions with the pad and gradually allow the pad to touch the surface. The circular motions must be about four inches in diameter, if working on a flat surface, but in case of narrow rounding surfaces, the strokes must be lengthwise with the grain, lifting the pad at the end of each stroke.

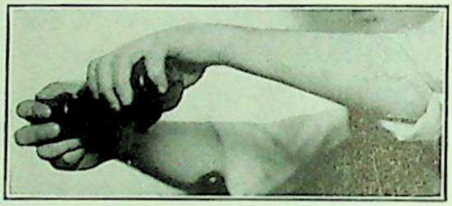


Plate XI.—Application of Material to the Rubbing Pad for French Polishing.

The pad must never be allowed to come in contact with the finish unless in motion. When making oval motions with the pad, concentrate on the size of circle and practice it just over the surface before allowing the rubber to pass over the finish or come in contact with it. When you have inscribed the proper oval or circle (four inches in diameter), overlap these circles in such a way as to completely cover the finish without skips, and then drop back over the same surface when the end of the piece is reached.

Never allow the rubber to pass over the same circle or any previous movement, but deviate to a certain extent every time you inscribe a circle with the rubber. The reason for this is obvious. If there is too much concentration on one spot, the rubber will soften this spot entirely too much and possibly stick or rough up the finish. This condition will result if the pad is stopped on the surface or allowed to move too slowly.

Of course a novice, trying the art of French polishing for the first time, is not capable of producing even a fair finish. So many things are to be remembered that one forgets some of them until the mistake is obvious, and frequent recurrence of the same thing will cause him to concentrate to avoid the error. Here are many of the things to do and the things not to do, in order to be successful in frenching.

**Plate XII.—French Polishing to Eliminate Marks or to Build Up Surface.**

*Positive Rules in French Polishing.*—Be sure you have a rubber as described in Chapter II. Care must be exercised in selecting materials that are easy to use, and those intended primarily for French polishing. Be sure that the surface has been sanded by the right grade paper with oil. Keep enough oil on the rubber to prevent sticking to the surface. Use circular motions whenever possible, always ending with strokes parallel with the longest edge.

*Negative Rules for French Polishing.*—Never use anything but muslin, or other soft material with no lint, for surface of rubber. Do not apply the rubber to the surface if flooded with any liquid material. It will soften the finish too much and cause streaks. Always distribute the material on pad by pressing in palm of other hand. Never stop the pad on the surface. When it is necessary to apply more material lift the rubber from the surface and place on top of bottle neck firmly and tip so that a small amount of material at a time is soaked up in the rubber. Do not make circles less than three, and better four, inches in diameter. Do not make rainbows when moving the pad across the surface with the grain but be sure that the rubber is moving in a straight line. This is only possible by bending the elbow when coming to center opposite the body and straightening when moving out to either end. A good plan is to follow the edge until you can make a straight stroke. Above all, do not apply material to a pad unless you need it. When the surface seems to yield and pull with the rubber, do not add more material as it will smear the surface.

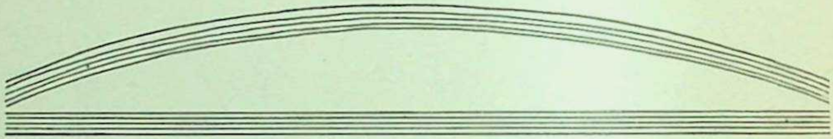


Plate XIII.—Showing Rainbow Strokes and Straight Strokes.

The best way to accomplish good work is to practice constantly, never allowing a day to pass without one good hour, taken at intervals, until you have mastered the ease of application.

## SPRAYING FOR PACKING MARKS

Frequently there will be found on lacquer finishes, especially on the cheaper grade of furniture, packing marks of a character that will permit spraying. This condition will arise where there happens to be only two coats of lacquer. The lacquer would have to be mostly gum and solvents and little pyroxlyn to mark, but competition and price buying has produced such material

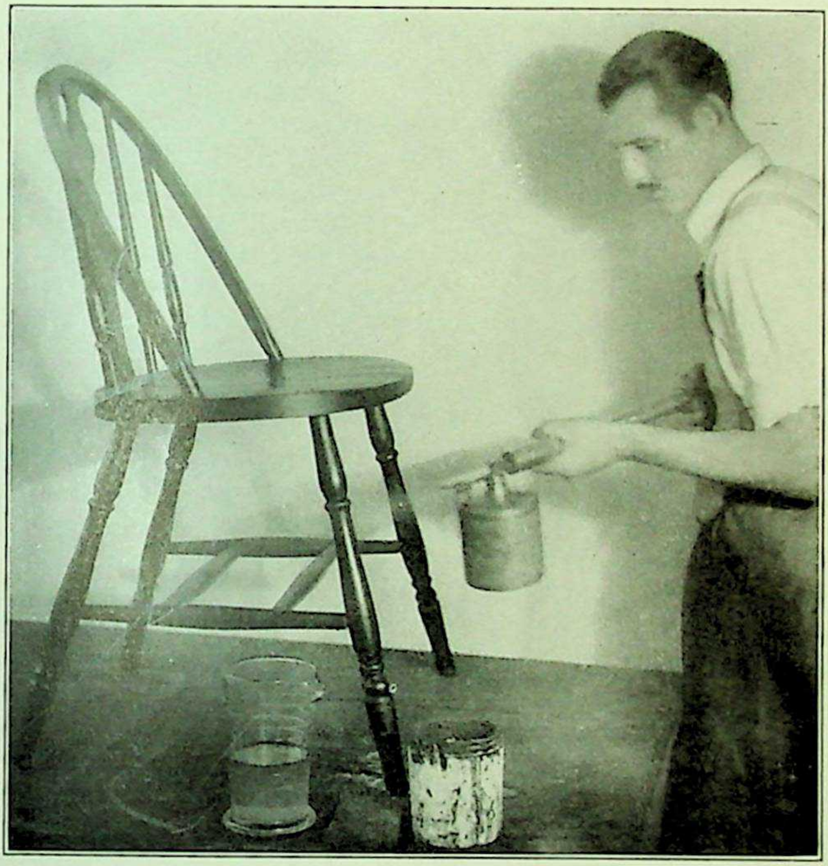


Plate XIV.—The Use of a Hand-Power Spray for Coating Small Surfaces with Any Thin Material.

which is applied to furniture. In such cases one is afraid to attempt rubbing them out with pumice and oil.

After the surface has been dry-sanded, it must be well cleaned off with a dry cloth or tack rag to pick up all dust. No oil should be used if a coating is to be brushed or sprayed over the surface after sanding, as it would not stick.

If a large spray gun is used, have pint jars to fit the gun and as many as you need so that you can have varnish, shellac, lacquer, French varnish, or any other materials ready in these jars for instantaneous use. Nothing is more provoking than the necessity for cleaning up equipment every time you wish to make a patch. It is far better to have a small hand-spray that will throw a continuous stream of material and several jars for the different materials, than to be obliged to clean up a large equipment every time a small patch is to be made with a spray.

## HOW TO SPRAY A PATCH

In the case of light marks that have been previously sanded out and the surface cleaned off, select the same or similar material to use in the spray as that used on the sanded surface originally.

By this is meant, that when you are patching a varnished surface, you would select a quick-drying varnish as the proper patching material. If very quick results are necessary on this surface, follow the French polishing method previously described.

If shellac is the original coating, either spray or french over with the same material. If lacquer (nitro-cellulose) is the original coating, nothing will patch this finish as well as the same material. Do not imagine that every material with the label "lacquer" is the material to use on nitro-cellulose lacquers. Many materials called "glazes" or "lacquers" are materials made of different spirit varnishes, and it is obvious that they do not contain nitro-cellulose, because all genuine nitro-cellulose products are labeled so that there can be no mistake in identification, especially in small containers.

One should acquaint himself with the use of the spray equipment before attempting to use it, and then be sure that a steady stream of the right pressure is forced onto the surface of a separate trial surface before applying to the spot to be patched. When sure that the spray will throw a steady stream of the right pressure to feather out around the spot and not spatter the surrounding surface, you may proceed.

Have the stream flowing before passing it over the spot, and then pass it back and forth slowly over the spot until you have a glossy surface. A good rule to follow is to lift the gun or spray away as soon as a gloss appears and then return quickly if necesary for a final spraying. One thing is necessary to a good patch, and that is that it must not be flooded, because it will then show a lap surrounding the spot and the spot will always appear at the first glance. It is better to have too little material than too much, for more can always be applied. After a few trials at spraying spots, one can determine just how much material should be sprayed on any particular surface to get the right texture and to match the surrounding surface.

While many things must be taken into consideration when patching a spot, in order that the spot will match the whole surface, one of the primary considerations is the right amount of sanding, as previously mentioned, as well as the amount of material.

*Filled and Unfilled Surfaces.*—A filled surface, of course, will be very smooth, provided enough material has been used in the coatings, and for this reason will be much easier to patch. Spraying or frenching smooth surfaces is a very easy job compared to the patching of open-grain finishes. If a smooth finish is flooded it will not be so apt to show, because it can be surfaced down to a level with the surrounding surface, and with the average care will offer little difficulty in matching.

When spraying over an unfilled surface, great care must be exercised to avoid spraying enough material over the spot to fill all the pores and thus have a smooth spot, whereas the rest of the surface will show open pores. To avoid this, pass over the surface with the spray at intervals long enough to allow the material to set. The material will flow into the pores and settle, allowing one to determine if enough has been used. Steel wool, 2/0, can be used to smooth down the spot when dry, and then another application can be made if necessary. The first thing to consider on an open-pore surface is the matching in amount of material and determine if the surface shows the pores like those on the spot.

*Surfacing Spray Patches.*—The most difficult part of patching with a spray is being able to match the rest of the surface as to dullness or polish. The surface may have been rubbed with two or three grades of pumice and oil, or with pumice and water, or it may have been surfaced with waterproof garnet paper, and occasionally with steel wool. One can tell just what has been used only by experience, and a novice must try all the methods until he finds the right one.

*Surfacing a Spray Patch with Pumice and Oil.*—Most all spray patches, especially shellac, lacquer, or varnish, can be rubbed with pumice and oil to match the surrounding surface, but one must determine if FF or FFF pumice should be used, and if the spot is too dull, add a little rottenstone to the rubbing mixture of pumice. Use the same method of rubbing, after the surface of the spot is dry and hard, as you would in finishing an entire surface, except that you must concentrate on the spot and refrain from putting much weight on the rubbing felt when you reach the outer rim of the spot. If you put too much pressure on the feathered edge, you will likely rub through. The material you select for rubbing is described under the heading in Chapter II of this Book, also in Book II, under the heading (Chapter VIII) *Finishing Coat.*

*Other Methods of Surfacing Sprayed Spots.*—Occasionally one can use waterproof paper for sanding a patch, and if so, either 6/0 or 7/0 can be used, depending on the texture desired for the finish, and then if this surface is too dull the surface is wiped off and rubbed with pumice and oil. This method is treated in Book II, Chapters VII and VIII. Great care must be exercised if water is used with either garnet paper or pumice stone, as these abrasives cut rapidly. Clean off with sponge and chamois frequently to see if the patch has been rubbed sufficiently.

Steel wool of the proper grade can be used if careful not to cut too deeply in spots. It is difficult to get this material to cut the same over the entire surface, as you usually wad up some of it and start rubbing back and forth over the spot, and as you do so, you will find that some places have been rubbed more than others. If this is continued you will rub through at some point before the spot has been brought down to a level with the surrounding surface.

No matter what material is used to surface at first, the pumice and oil, with a possible addition of rottenstone, will, in all probability, be needed as a finishing touch to get the desired lustre or texture to the finish.

Patching spots with a spray at its best, is a difficult undertaking and can only be accomplished after many trials and by one who has some idea as to the original finish and just how much material to spray over the sanded surface. It is not expected that anyone who is unfamiliar with finishes can readily patch a spot by merely following these directions, but if anyone, desiring to patch a spot in the manner described, will first attempt the job on an old piece or obscure surface, and then if successful, perform the same operation on the spot to be patched, the results will be gratifying. Never patch a spot on a kind of finish unfamiliar to you until you have first demonstrated on another finish of the same kind that you are capable of doing the job.

If spots are sanded too much before spraying and the stain has been disturbed or sanded off, refer to Chapter V for information as to staining spots.

# CHAPTER IV

## PATCHING SCRATCHES

### LIGHT SCRATCHES

A LIGHT scratch may be described as a light abrasion in the last coat of finish, caused by a nail, pin or any other sharp instrument. It does not penetrate as deep as the wood, but merely in the finish and usually in the top coat.

*Surfacing.*—A light scratch is always sanded with 6/0 garnet finishing paper with a little rubbing oil on the paper, and if the scratch is on a flat surface, a felt or cork block should be used under the paper to insure level sanding. The scratch should be sanded out if in the surface coat, but if too deep, so that sanding out would cut through to the wood, use the method described in this chapter for deep scratches. The use of oil on the paper avoids excessive cutting of the surrounding surface and allows the paper to cut easier by not clogging it up with varnish or lacquer.

If one is to spray over the spot where the scratch has been sanded out, do not use oil on the paper. Use water under waterproof paper of the same grade and clean off, allowing ample time to dry before spraying, or else sand with the paper dry, or use steel wool 2/0.

*French Polishing Light Scratches.*—On varnish or shellac surfaces it is always best to French polish the spot after sanding and then match the surrounding surface. This method can be used for lacquer surfaces also, but matching the rest of the finish is more difficult, as the spot always seems brighter, and this method always fills the pores. Most lacquer finishes show open pores to a certain extent unless heavily coated.

A good amalgamater, diluted with denatured alcohol about half and half, may be used. French varnish may be used the same way. If the scratch is on a plane surface, you can eliminate it by making circular motions with the rubber, overlapping each stroke, about four inches in diameter. Make these circles by overlapping and passing back and forth across the spot until the surface has softened and worked together, eliminating the scratch. If the surface of the pad becomes dry, add more material, but if the rubber becomes too tacky and pulls on the surface, causing streaks on the finish, the addition of lemon oil to the pad or rubber will eliminate the sticking.

If the scratch is on a straight narrow surface or a curved surface, it will be necessary to make the strokes of the rubber lengthwise with the grain of the wood, overlapping each stroke. When the end of the stroke has been reached, whether at the end of the surface or at the end of the scratch or sanded portion, raise the hand just enough to take the rubber off the surface and gradually allow it to rest on the surface again on the backward stroke. This is done to avoid having the rubber stick to the surface by an abrupt stop at the end of the stroke before coming back across the same plane.

The rubber or pad must never be allowed to stop on the surface. The rubber must not be soaked with material or flooded with oil. The following things must be remembered:

Never add amalgamater or other material when the rubber is pulling.

Use only enough oil on the pad to prevent sticking to the surface; the less oil used the clearer will be the finish.

Always apply the pad or rubber to the opposite hand to spread the material before applying to the surface.

Remember the surface should look as smooth as a mirror when finished.

Always finish lightly with the grain of the wood. The last operation is very important, but will avail nothing if the circular strokes leave marks in the finish, because the strokes with the grain are only for finishing and cannot easily take out circular strokes. Be sure that the surface is very smooth before attempting to finish with the grain. If necessary allow time for the surface to dry and then sand with dry garnet paper, 7/0, afterward stroking with the rubber with the grain to finish.

*Matching the Surrounding Surface.*—After eliminating a light scratch by French polishing, it is necessary to do one of two things; either to polish up the rest of the surface to match or else dull the spot to match the rest of the plane. If working on a highly polished surface, you will have only to make a good job of the polishing and perhaps polish the rest of the immediate surface.

If the work is on a very small surface, it is always best to polish the rest of the surface by frenching, for in no other way can the work be so easily matched.

If the surface is extremely large and the scratch repaired is small, you would not be required to patch the entire surface, but rather attempt to match the rest of the surface with the spot you have frenched. In most cases it will be necessary to dull the spot to match.

*Dulling the Patch by Brush Method.*—The most effective way to dull a frenched surface is to use a stiff bristle brush in which has been dusted a quantity of FFF pumice stone, brushing this over the spot rapidly before the spot has time to dry thoroughly. Another method, one that has been tried with varying success, is to allow the spot to dry hard and then rub with pumice and oil to match the rest of the surface. This does not always work for the reason that French varnish has been used and the coating is so thin, that, when rubbed with a felt pad and pumice stone, the surface cuts through and the patch is ruined.

For quick work on small spots and especially large surfaces dull with the dry brush method described above. Of course one must select a brush with comparatively short bristles, stiff enough so that they will scratch the surface as they pass over and not bend on their sides. The bristles must be cut off square and not chisel-type. The correct amount of pumice is a matter for experiment.

Many finishers use a dulling brush with rubbing oil and pumice for dulling spots after they are hard, but this method has never met with much success and can be relied on only in places so obscure as not to be noticed anyway.

## SPRAYING SCRATCHES

After the dry-sanding process, spray a coat of the same material as originally used on the surface. Use lacquer if the last coat of finish was lacquer or shellac. If the finish is varnish, it will usually crackle if lacquer is sprayed on, so in case of doubt,

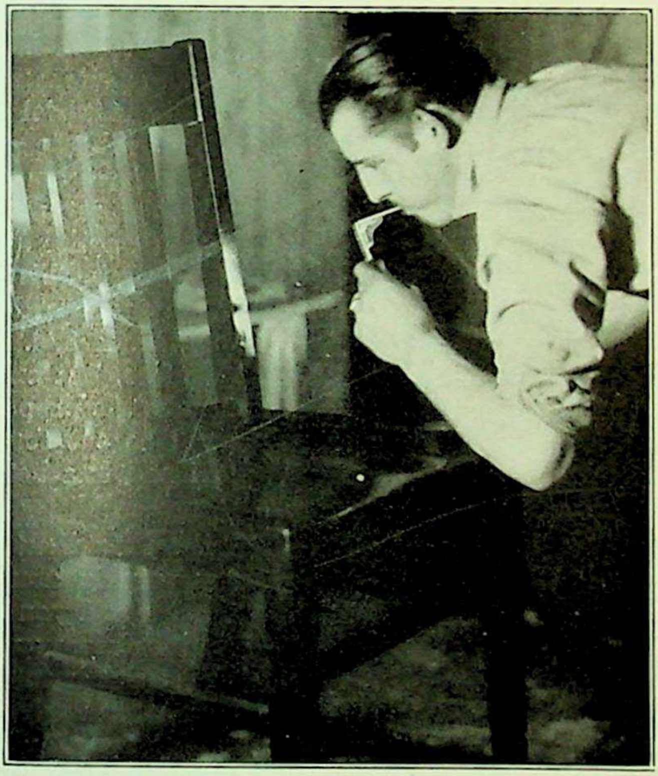


**Plate XV.—The Use of a Small Mouth Spray in Patching Small Abrasions.**

try the lacquer over an obscure portion where it would make little difference if it cracked, and can be easily repaired.

*Matching a Frenched or Sprayed Spot.*—The matching process is sometimes very difficult. In reality it is the surrounding surface we match and not the spot, and we do this by sanding or rubbing the spot with some abrasive in such a way as to give it the same appearance as the rest of the surface.

*Abrasives Used in Patch Matching.*—A safe method is to match a surface by rubbing with pumice stone FF and rubbing oil, especially if the surface is a satin finish (satin is between dull and high polish). After matching, if the surface seems too dull, add a little rottenstone to the rubbing material and the surface will brighten up. Be careful not to rub the spot to a lower level than the surrounding surface before you find out that the spot does not match. The fact that most finished surfaces today are rubbed to a satin finish with pumice stone and oil indicates that most patches can be surfaced in this manner.

Some patchers repair many spots in a way that will pass by simply rubbing them down with steel wool, grade 3/0. This of course may do for obscure portions of a piece, but on a table top or other noticeable places, it will not make the proper repair for the reason that the feathered edge will be cut through by the time the spot is leveled. A steel wool pad is a better tool, to cut evenly.

Waterproof garnet paper, 6/0 or 7/0, is an excellent product to use on lacquer or varnish if sufficient care is exercised in using it. This paper cuts very fast with water and you soon get to the level, and many times below level, before you see the mistake. The only safe way to use this material is to clean off the sanded portion frequently with a sponge and wipe with a chamois to ascertain if you have finished to the point where you wish to stop, and perhaps finish with pumice and oil. Very few surfaces are finished with a waterproof garnet paper.

In conclusion it would not be amiss to say that sufficient time must be allowed between the spraying operation and surfacing for a good hard film to be formed, else you will rub up the coating when you start to surface. For lacquer, allow four hours;

the same for shellac, but at least twenty-four hours for a rubbing varnish, enamel, etc.

The matching process by surfacing when a spot has been French polished has been previously described in this chapter. If at least twelve hours have been allowed for drying, a spot may be rubbed with any of the above mentioned materials. Most French polish patches are dulled immediately by the dry brush method for the reason that the pieces must be moved or delivered at once.

## REPAIRING DEEP SCRATCHES

While most any kind of a scratch is detrimental to a finish and hard to repair if across the grain, let one be made into the wood and across the grain and you have a real problem to eliminate it without detection.

*Filling Deep Scratches.*—The best known material for filling deep scratches is wood cement, commonly called shellac sticks. A combination of gums (usually rosin and shellac) are melted together in a vessel over a gas flame or steam jacket kettle and poured into molds. This material when cool can be taken out in sticks in handy shape to use for "burning-in," a term frequently used when reference is made to filling holes or scratches.

*The Cement Knife.*—The cement knife, previously described, may be a flexible or stiff-bladed, according to choice, and one should become accustomed to using both kinds. Many times a flexible knife is necessary in case you are working on a concave surface or in the center of a large surface where it is imposible to lay the blade flat on the finish. On all edges or narrow flat surfaces it is better to use a stiff blade, for the one big advantage of the latter is that it will hold heat much longer, thus saving time.

*Selecting Cement Colors.*—The right color of cement has a great deal to do with the final appearance of the scratch that has been filled, and a great amount of care must be used in selecting the cement before burning-in. The depth of the scratch decides what cement to use. If the scratch has not approached the stain and the finish is shallow, a real light transparent cement should be used.

The light transparent cement stick must be no darker when burned in than the finish. If it is darker the scratch will appear just that much darker. It is always policy to burn-in with transparent cement whenever possible because the grain and color will show through exactly as the surrounding surface. This is especially true when the scratch is across the grain of the wood, and in repairing by burning-in any little difference in color will be easily noticeable.

When the scratch is deep into the stain and wood or several coats of the finish, it is always advisable to burn-in with a colored stick of a shade lighter than the surrounding finish, and afterwards stain to match. You can be sure in selecting the cement colors by piling up a quantity of the cement after melting about the depth of the scratch or else make a similar scratch on something for trial and burn-in for a test. Accuracy can be gained only in this way, as the cement, when tinted with aniline dye, has a deceptive appearance and will be darker in the stick than in the scratch by reason of the depth of the stick as compared to the scratch. The deeper the scratch the darker will be the cement in the scratch, so one must be sure of the color and the shade it will be when burned-in before performing the work. As this cement is made in as many as fifty colors, it is not difficult to obtain all the colors needed.

Many shades of walnut are needed, as well as mahogany and oak. For decorative pieces colors are made in bright shades of red, yellow, blue, gray, green, etc. Any concern making these sticks will be glad to furnish a color chart so you can order them intelligently. When you have laid aside three sticks you think will match the color of the finish, try them out and select the one just a shade lighter than the finish when burned into the scratch.

### "BURNING-IN" PROCESS FOR SCRATCHES

When you are sure you have selected the right color of cement, heat your knife over the alcohol torch, holding the extreme end of the blade about one inch past the flame and rest the cement stick on the end of the blade.

The cement should not be allowed to run off the knife, but as soon as you feel you have sufficient cement melted on the knife to fill the scratch, you can then withdraw the cement and knife from the flame and proceed to fill the scratch.

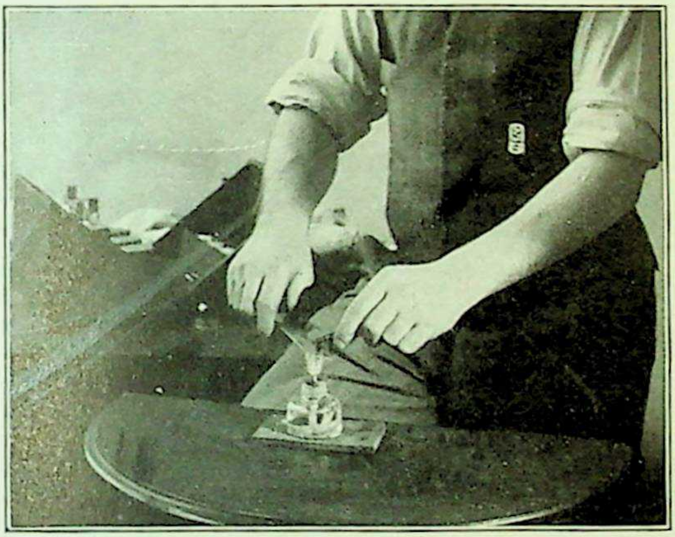


Plate XVI.—Holding the Knife in Right Hand and Cement in Left, Resting the Cement on the Knife Over the Flame.

Pass the knife along the full length of the scratch just fast enough to allow sufficient cement to run into the scratch so that when smoothed down it will fill just a little above the level of the surrounding surface. After you have flowed into the scratch sufficient cement to fill above the level when smoothed down, place a wet finger over the fill and press down so as to fill all crevices and eliminate air bubbles that may have been pocketed when you run the cement into the scratch. After the cement has hardened, smooth it down with the flat side of the knife.

Another method of burning-in scratches is used in which the cement is melted on the knife as before and then pressed into the scratch with the edge of the knife, as one would apply putty to a window pane. While in some instances this may be satisfactory, as on perpendicular surfaces not easily accessible, it is

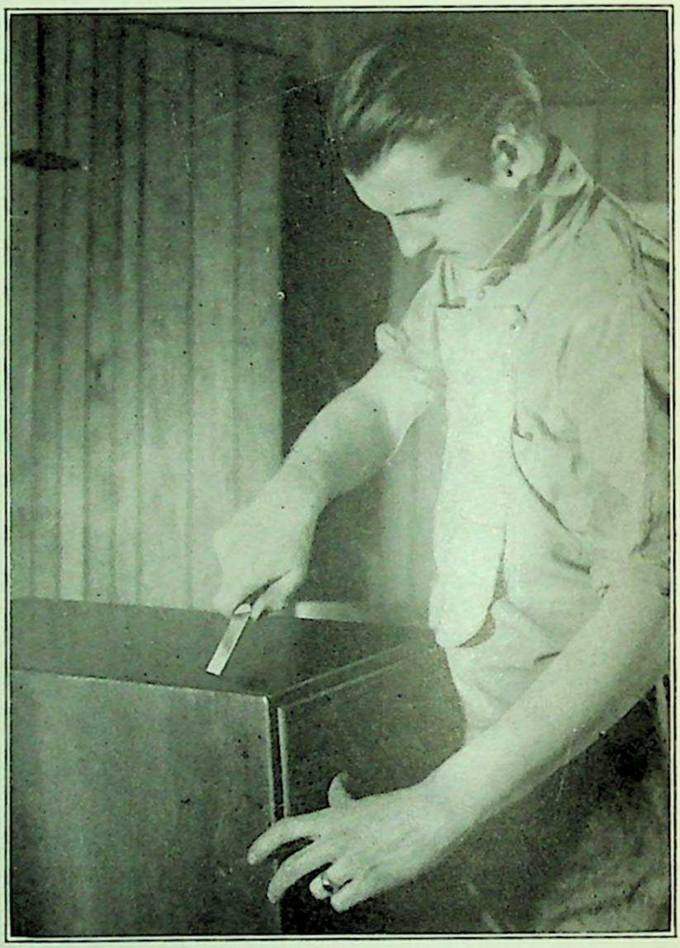


Plate XVII.—Showing the Spreading of the Cement with the Knife After Filling Scratches.

not the best way on a horizontal surface nor any surface where it is easy to use the knife. The principal defect in this method is the burning of the surrounding surface by reason of the heated knife touching it in the many attempts to putty in the scratch with a material that must be kept hot to spread.

One method that is used quite successfully on fine finishes in piano factories and shops is to melt just sufficient cement (the amount can be learned only by much experience, and at best is a guess) on the knife so that when you pass over the scratch lengthwise with a sweeping stroke, at the angle shown in the illustration, you will have filled the scratch without greatly disturbing the rest of the finish.

*Dont's for Burning-In.*—Do not burn in with an ordinary putty knife or case knife; use a knife made for this purpose. Do not allow the cement to touch the blaze; it will turn rubber-like. Do not over-fill a scratch—that much more to remove—unnecessary. Do not leave a color if too dark; remove and fill again. Do not allow the knife to overheat the surrounding finish, but pass over quickly and without excessive heat.

*Smoothing a Burned-in Scratch.*—This operation is most particular for the reason that the finish must be absolutely level with the surrounding surface. If not smooth and level, it may be noticed a great deal more than if off color, and at a greater distance. To insure a smooth surface use a felt pad saturated with asphalt naphtha and rub over the spot with an even pressure. This will gradually reduce the shellac burned in to the level of the surrounding finish. This leaves the cement dull and on obscure surfaces nothing else need be done, but on surfaces where the spot is easily noticed other methods must be used.

*Rubbing Cement Spots with Pumice and Oil.*—When working on a satin finish rub the spot with FF or FFF pumice stone and rubbing oil on a felt until it matches the surrounding surface. Sometimes a little rottenstone is needed to give just a little lustre to the finish. Fine scratches are nearly always rubbed out in this way, and the deep ones when filled with cement can mostly be smoothed down with pumice and oil. When this method is used it is imperative that you smooth the cement down nearly level with the surface with the knife and possibly rub it with naphtha and a clean felt.

Very little rubbing need be done if the spot has been prepared properly, and if too much pressure is put on the rubbing pad, it will cut through the finish and require frenching to build it up again. This would cause more work than the scratch originally, so close watching and frequent inspection are essential when rubbing down a spot filled with cement.

### OTHER SURFACING METHODS

Waterproof garnet paper and water or pumice and water may be used on extremely dull finishes, but occasions for their use are rare. Dry garnet paper, grade 6/0 or 7/0, may be used on a block if the surface is quite level and you want to coat over the surface with another coat of finishing material.

### SURFACING CEMENT FOR FRENCHING

When you intend to French polish the surface or spot with amalgamater or French varnish, rub the spot down nearly level with naphtha on a clean felt and then sand the surface level and smooth with fine garnet paper, with oil on the paper. If the surface is rounding, the sheet of paper is cut in eighths, as in any other sanding operation, and held in the hand between the third and little finger. With oil on the surface, sand lightly until smooth, but do not cut into the other finish any more than necessary to get a smooth spot, neither higher nor lower than the surrounding finish.

### POLISHING CEMENT IN SCRATCHES

Polish with rottenstone and oil (in this case it is best to use rottenstone cake instead of powder to eliminate any grit that may happen to get into powdered rottenstone left open) and with little pressure and a few strokes with the grain, a high polish will result. The rottenstone may also be used with water. The most common way of polishing a spot filled with wood cement is to surface it down and then French polish with amalgamater. This will leave a good clear finish and can be accomplished quickly, at the same time making a clear finish with no evidence of the joining of the cement with the other finish. Frequently it will be absolutely necessary to french a surface to get a perfect job, as when the patch is in a very conspicuous place. Make a few circular motions to draw out all the sanding marks and then a few strokes with the grain, lifting the pad at the end of each stroke and having the pad just tacky, as described in the chapter on frenching.

## STAINING CEMENT IN SCRATCHES

Whenever cement is burned into a scratch across the grain and into a deep scratch any place, it is necessary to use some stain to make the spot match the entire surface in color or shade. The difficulties encountered in rendering invisible deep scratches across the grain in conspicuous places are clearly demonstrated in the following case: The scratch, about three inches long and into the wood, was across the grain of a walnut buffet. The scratch was first cleaned out with a pen knife, to make sure no dirt was present, and was sanded lightly with 7/0 garnet paper, *dry*, to knock off rough edges surrounding the scratch.

The spot was then filled with cement, which when burned-in, was a shade lighter than the finish. The spot was then rubbed down with naphtha on a clean felt almost level with the finish. Care was exercised not to rub too much and take out more than necessary. A light sanding with 7/0 garnet paper brought the spot down smooth and level with the surrounding surface. Looking across the surface, with the buffet between the patcher and the light, showed the spot level, neither high nor low. (If the spot is high or low at this stage, it must be remedied before proceeding.) The surface was then wiped dry with a polish cloth to pick up the dust.

After the level surface was cleaned off, the next problem was to make the color match perfectly with the rest of the finish, as the cement was a shade lighter than the lightest grain of the other finish. A French walnut stain, spirit soluble, in powder form, was used by dipping the ball of the forefinger of the left hand into the stain and rubbing between the finger and thumb to eliminate all lumps or scratchy substances. The rubber was

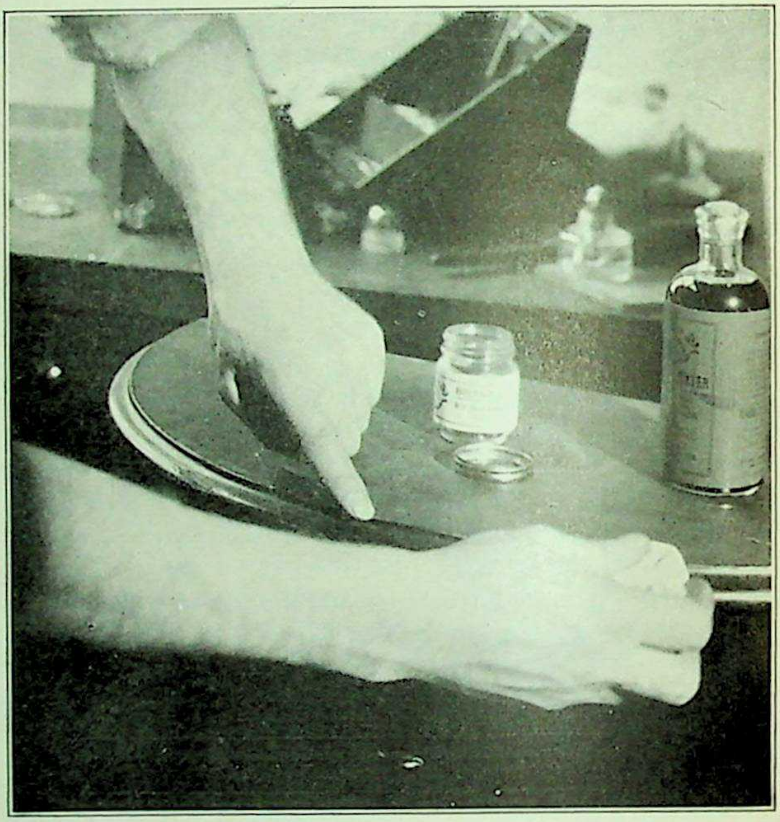


Plate XVIII.—Staining a Spot by Applying Stain in Powder Form to a Soft Frenched Surface and Dissolving by Passing Over Lightly with a Tacky Rubber.

held in the right hand, and after polishing the spot with the rubber and amalgamater until absolutely smooth, the stain was applied with the finger rubbing across the scratch and with the grain, but applying stain only to the lighter flakes of the grain.

You must remember that the surface was tacky and soft, sufficiently so to allow the stain to stick to the surface when applied with the finger and, of course, very little stain was applied at a time. This is the advantage of applying the stain with the finger, as little of the powder will adhere to the finger. The rubber was passed over the stained spot each time stain was applied and the rubber had just enough liquid material on it so that it was sufficiently tacky to pull away from the palm of the left hand reluctantly. The material on the rubber softens the finish, so that the powder aniline sticks to it, and then the same material on the rubber dissolves the stain on the spot and allows it to penetrate into the finish, and thus color the cement to a shade to match the light flakes of the walnut finish.

The same method was used to match the dark flakes of the grain or figure but with American walnut spirit stain, powder form. One is limited in this method only to spots too small to touch with the ball of the forefinger and in such cases, a brush will suffice with liquid stain. A known spirit stain can be dissolved in alcohol and a penciling brush used to line in such places too small to cover with the finger.

On woods like the walnut buffet, or mahogany, mistakes in matching can be covered up frequently by placing a dark grain where none existed. In this particular instance a dark grain was prolonged across the scratch and matched the other places, and after matching the texture of the rubbed finish, it was not noticeable to anyone not knowing where the scratch was.

The spot must be polished after each application of stain. Pass the rubber back and forth at least twice after each application of stain, but no more than necessary. If the stain does not dissolve, it is an indication that the rubber is dry. If you take off all the stain or spread it out, your pad is too wet, and not tacky as it should be.

### DULLING TO MATCH FINISH

This method of dulling has been given in a previous chapter, but a repetition will serve to illustrate how this job was finished. As soon as the surface was matched with stain and the spot was absolutely smooth, without any flaws or marks from the rubber, a stiff Chinese bristle brush, three inches wide, was used and brushed over briskly, back and forth a few times with the grain, until the spot was the same in dullness as the entire finish. This completed the job—a perfect patch.

It should be added that pumice stone in FF or FFF must be used sometimes to get the proper texture to the finish, but for most satin finishes the dry brush will suffice.

# CHAPTER V

## INDENTATIONS AND RUBBED THROUGH PLACES

ALL THE different methods in patching are employed in the repair of damages under this double heading, and for that reason some repetition will be noticed. For minute details in French polishing and burning-in, refer to Chapters III and IV, as these operations will not be fully explained in this chapter.

### INDENTATIONS

If any solid or heavy material is allowed to fall on the finished surface of a piece of furniture, the weight will cause an indentation. Some woods are softer than others and will, of course, dent easier. If the finish is very thin, the dent will be more into the wood than if the finish is thick, as in the case of a piano, with several coats of varnish. Placing heavy objects on a finish will sometimes cause indentations, especially if the object has sharp points which cut into the finish. Setting dishes down heavily on a finished surface, even if a cloth is over the table, will frequently cause an indentation.

*Filling Indentations.*—When a dent is made on a finished piece it frequently does not go into the wood, but merely presses the finish down below the level, and seldom removes the finish or stain. In this case it is only necessary to use transparent wood cement of the shade nearest to the finish, *i. e.*, reddish transparent, if mahogany, and brownish transparent if walnut or brown mahogany. For light oak or maple, use the lightest transparent cement.

If the indentations are deep, and it appears that they are deeper than the finish, it will not be correct to use a transparent cement unless the finish is considerably darker than the solid stick of cement. The reason for this should be obvious. A deep fill of wood cement will have a darker shade than a shallow fill.

*When to Use Solid Color Cement.*—When the indentation is real deep and the stain has been removed, select a colored cement, of a shade lighter than the finish, after the cement has been burned-in. Never depend on selecting the right color cement by looking at the sticks. Make a trial of the cement in about the thickness of the depth of the indentation.

Follow the directions found in Chapter IV for burning-in and surfacing a deep scratch, for the same methods must be used in the filling of an indentation. The only difference is the feathered edge of the cement around the edges of the indentation. When a three-cornered indentation occurs, it is usually shallow at the edge and deep in the center, and when it is smoothed down apparently level and French polished you will easily notice uneven places in the spot by looking across the piece with the repair between you and the light.

### ROUTINE OPERATIONS

When burning-in indentations, whether transparent or solid color cement is used, the same methods are employed, as follows: The spot must be clean and dry before beginning the repair work. Heat the cement on the knife over an alcohol lamp and allow the cement to run into the dent until it has been filled. Do not allow it to run over the edges of the dent, especially if you are working on thin finishes, for you will cut through the finish trying to get the surface level.

Press down the cement into the spot with a moist finger immediately after filling and before the cement has time to get cold. After this is done, level the cement by quickly passing the flat side of the knife while hot over the spot. If any excess of cement is burned into the dent it will flow over the finish, so just sufficient cement to make a good fill should be used.

The surfacing of cement in any kind of deep damage is the same regardless of the finish, unless the cement and entire surface is to be refinished. If a coating is to be placed over the cement, do not use any oil for sanding, but sand with dry garnet paper 6/0 or else use 2/0 steel wool. Where the spray is used in patching over cement, sand with dry garnet paper also. Remember always to clean off the surface after sanding or surfacing with any material, whether dry or wet, to prevent particles of dirt or finish from getting into the finish. A tack rag should be used for dry sanded surfaces and a dry rag for wet or oily surfaces before proceeding with the finish or patch.

Oil should always be used with garnet paper for sanding down a cement spot, if you expect to French polish afterward, or use pumice stone and oil to rub the spot down before frenching. Naphtha can be used on a felt, if the spot is inconspicuous or unusually high after filling.

## BRIEF OF PATCHING OPERATIONS FOR INDENTATIONS

*Varnished Surfaces.*—Fill with transparent or colored wood cement. Surface down first with naphtha and felt. Finish by sanding with fine garnet paper and oil on a felt or cork block to make absolutely level. French polish with amalgamater or other like products until smooth and then stain up to match the grain of wood. Dull if necessary with stiff bristle brush and pumice.

*Lacquer or Shellac.*—Fill with transparent or colored cement of lighter shade. Surface dry with garnet paper or steel wool. Make absolutely level before finishing. Spray over a coat of a good spray clear lacquer after staining if necessary. After the lacquer has dried at least two hours rub with pumice stone and oil or steel wool as desired.

*Enamels.*—Fill with colored cement and surface dry. Tint a lacquer or enamel and spray or brush over the spot, after which rub with pumice.

For the repair of damages to enameled surfaces, refer to Chapter VII, where full information is given as to preparation of materials and their application. For full information regarding the damage to decorative finishes, refer to Chapter VIII.

### RUBBED THROUGH PLACES

Any place where the finish has been removed by rubbing against another object is classified as "rubbed through." Under this heading we have wide scratches, where the finish and stain have been removed, leaving the wood bare. Places not larger than two or three square inches may be patched, but large spots, where the finish is entirely removed, should be treated in a different manner. Many times a spot is so large that it would require more time to patch it than to refinish it.

*Preparing a Rubbed Through Spot.*—Regardless of the size of a spot, it will be much larger before your patch is finished by reason of feathering out the edges before frenching or spraying. If working on a varnished surface, the problem will be somewhat easier, especially the staining operation. Prepare the spot for frenching by sanding out the edges with 5/0 garnet paper and oil. On flat surfaces, using a felt or cork block, sand until the edges are not perceptible by passing the hand over the spot. To insure a perfect job, sand out the edges of the spot at first with the hand, using 6/0 garnet paper for finishing up.

If working on a lacquered surface (not decorative) and desire to have the same finish on the spot as the entire surface, in other words, if you intend to spray a coat of lacquer over the spot, it will be necessary to feather out the edges of the spot with 5/0 or 6/0 garnet paper without oil and clean off well before staining.

*Staining the Spot Before Spraying.*—It is far more difficult to stain a spot before applying the finishing coat, unless you happen to have some of the original stain that was used, than staining the spot after it has been built up level with the surface. Previous staining is necessary before spraying lacquer to have the best kind of a finished job.

Water stain, applied with a brush, was the method formerly used, but this method is too difficult unless the original stain can be had in the same formula as used on the piece. It is best to use some kind of frenching material, as shellac, French varnish, or amalgamater, and french the spot to some extent after sanding and then apply the stain to the spot with the finger, as directed in Chapter IV. In this way a perfect match is made with the spirit stain, whereas if water stain in uncertain proportions is used the guess may be incorrect. The spraying is done after the spot has been stained and rubbed with steel wool, after allowing two hours to dry.

*Spraying a Rubbed Through Spot.*—All dust and pieces of steel wool must be wiped off with a tack rag before spraying. Remember that a spray should not be used in patching except on lacquer, enamel or decorated surfaces. Varnish or shellac surfaces can always be French polished much easier.

First fill the cup with the proper material, in this case, clear nitro-cellulose lacquer, especially made for spray use. Start the spray and keep up a good pressure all the time, as a low pressure allows the material to fall on the surface in small drops. Of course a very high pressure will allow a waste of material and a "dusty" surface, so a pressure of about forty pounds is the minimum.

Pass the spray over the spot several times and do not hesitate long enough to flood the surface as this will make a conspicuous place on an open-pore surface. Be sure that the edges are feathered out so that there is no perceptible edge when finished.

*How to Dull Sprayed Patches.*—It has been found difficult to make a spot of the same dullness as the surrounding surface without using the same material for dulling the spot as was used originally on the entire surface. Steel wool has proved to be a very effective means of smoothing a spot that has been sprayer with lacquer, but requires much care in its use to prevent cutting through the feathered edges. A fine grade should be used, not coarser than 2/0, finishing with 3/0. Coarser wool will scratch the surface.

Pumice stone and oil on a felt rubbing block is an effective means of rubbing down a spot of lacquer and will usually match the other surface in dullness, but it is necessary to clean off the spot frequently to know just when the proper amount of rubbing has been done.

Sanding a spot of lacquer with dry or waterproof paper and water may be satisfactory in some instances, but the operation is more or less difficult. Waterproof garnet paper used with water is liable to cut through on the feathered edge, raise the grain and remove the water stain. Dry garnet finishing paper will heat the spot and thus prevent smooth sanding unless the surface is very hard. Furthermore, dry paper used on spots makes it very difficult to level the spot without cutting through around it.

Regardless of which method one may use to level the spot with the surrounding surface, it is necessary to slush the spot with FFF pumice and oil and wipe off to match the oil rubbing on the rest of the surface. Sometimes a little rottenstone must be added to the slush to brighten the polish.

*Rubbed Through Places on Varnish or Shellac.*—The French polishing method has been developed to surpass all other methods in patching damages on all varnish or shellac surfaces. Formerly it was thought necessary to refinish any piece that was damaged to the extent of having all the varnish, stain, and even part of the wood removed. Now it is possible to repair any kind of rubbed through place to match exactly the surrounding finish, and the only reason for refinishing any of the surfaces damaged is because refinishing will consume less valuable time than would be consumed in patching. Of course the number and extent of the damages to a piece determine whether it is to be refinished or patched.

*Sanding Spot to Feathered Edge.*—Sand the spot out around the edges so that the edge will not be noticed and the whole spot is level with the surrounding surface. This sanding is done with 5/0 garnet finishing paper, with just a little oil on the paper, to prevent scratching the varnish. After the spot has been sanded with this paper, finish off with 7/0 garnet finishing paper over a felt block, and with a little oil on the surface. Clean off the spot with a dry cloth and proceed to polish.

*Amalgamating the Surface.*—The use of amalgamater on a rubber or sponge, as described in Chapter II, applied in limited amounts and at frequent intervals, draws the varnish on the surrounding surface over the spot and deposits it there together with the gum from the amalgamater, and thus forms a base for additional material and stain. Circular motions with the rubber, about four inches in diameter and overlapping each other, crossing the spot as much as possible, and concentrating on the spot, soon bring about a glazed surface. Any materials sold for frenching will do the work, but the thinner liquids are to be preferred to French varnish for this operation. After the glaze is permanent, finish off with strokes parallel to the figure of the wood.

*Building up a Spot.*—There is only one material that should be used for building up a spot on a varnished surface. Shellac was the material formerly used for this purpose and, as mentioned before, whole surfaces were finished with shellac by the French polishing method. Today we have a refined shellac gum, cut in alcohol, known as French varnish, a clear, transparent varnish, more satisfactory than any other for building up a spot on varnish or shellac finishes.

The French varnish is applied with a rubber, the same as amalgamater or any of the other materials for frenching. It can be diluted with denatured alcohol to any desired consistency and applied with circular motions overlapping, or with sweeping strokes, lifting the pad away from the surface at the end of each stroke. A little oil (just a drop or two), applied to the surface of the pad on applying the French varnish, will result in quicker building of the spot and prevent pulling of the rubber on the finish. If no oil is used, the rubber, unless it contains considerable oil, will pull off all the finish on the spot and deposit it on the surrounding finish.

*Finishing the Spot.*—Always use amalgamater, or other light frenching liquids, for the finish of the spot, and the surface will take on a better polish and be smoother, and smoothness is really what disguises the spot. Sometimes it is better to polish off the entire surface, especially if conspicuous and small. Even large tops of tables or dressers will be more easily matched if the entire surface is polished and then dulled if desired.

*Staining the Spot.*—The staining of a rubbed through place is accomplished in the same manner as the staining of a deep scratch. After the spot has been built up level and smooth, apply the desired spirit aniline stain in powder form with the tip of the index finger. The material on the spot must be soft enough to allow the stain to adhere without brushing off and yet hard enough so the finger will not make impressions in the finish. This operation requires more practice than any operation in patching. More repair jobs are failures as a result of poor matching of stain than from any other cause. If a spot is of such a color, or needs such a color, as cannot be matched with any single color of stain in the kit, apply a stain of lighter color and then shade with black or brown. Most houses dealing in stains have mixed colors that will match any finish.

*Dulling the Spot to Match.*—If the entire surface is polished, the dulling process will be comparatively easy. Take a large flat duster and trim off the bristles square, or at right angles, to the side of the brush. This will make a stubby brush with bristles about two inches long. Fill with FFF pumice stone and brush across the entire surface, overlapping each stroke to avoid skips. It is necessary to do this just after frenching and before the surface has time to dry, otherwise the effort is futile. A good stiff varnish or paint brush, too worn to be of further use in applying material, can be made into a good dulling brush by clipping off the bristles about two or three inches from the ferrule. Regular rubbing brushes are not quite resilient enough to dull flat surfaces, but can be used for turned surfaces.

After dulling with a brush and pumice stone, and the surface has had about two hours to dry hard, oil off with lemon oil polish and wipe clean with a dry cloth. Considerable experience in repairing damages of this kind is needed to determine the amount of brushing and oiling to produce the correct texture to the finish.

## CHAPTER VI

### HOW TO REMOVE WATER MARKS ON FINISH

WATER marks are found on most varnish finishes and shellac surfaces when exposed to wet weather, or when water is allowed to stand any length of time on the finish. Nitrocellulose lacquers and varnishes made by using tung oil are supposed to be waterproof and not subject to stains from water.

*Materials.*—Almost any spirit varnish will cause a reaction on the finish, restoring the original color to the finish and eliminating the white opaque effect. Many materials are made for removing water marks, such as amalgamaters, glazes, and specially prepared lacquers for brushing or spraying.

*Brushing Method.*—Sand the surface thoroughly with 3/0 garnet finishing paper. The coarse paper is used to cut canals into the finish and thus allow penetration of the amalgamating liquid. Clean off dry with a duster and then wipe with a tack rag dipped in varnish and allowed to nearly dry. This will pick up all loose dust particles. Flow the material on as heavily as possible without running, having the surface lying horizontal if possible. Each brushful should be followed by another as quickly as possible, overlapping all strokes, covering the surface thoroughly. Allow this coat to dry twelve to twenty-four hours, or until the surface is hard and will not mark by pressing with the palm of the hand.

*Spraying Method.*—Spray the material on the surface in a horizontal position, if possible, thoroughly covering the surface (this, of course, after the sanding), and allow to dry the same time as though brushed on. Sometimes an extra coat is necessary when sprayed on, unless the first coat has been heavy. Sanding of the surfaces after brushing or spraying cannot be done until thoroughly hard. Steel wool can be used if no further coats are required.

*French Polishing on Water Spots.*—Many times one will be called upon to remove a water spot of small dimensions, and it would be folly to flow over an amalgamater if one could remove it by French polishing, and even when it cannot be removed with a rubber, one can frequently spray over the spot without making much of a lap over the surrounding surface. Sand the spot with 5/0 garnet finishing paper and clean off dry. Saturate the rubber with amalgamater and apply to the spot, rubbing in four-inch circles, crossing the spot as much as possible and overlapping the circles closely together. Make frequent applications of material to the rubber so that the spot will become soft, and allow the amalgamater to penetrate to the depth of the white film.

After the white has disappeared, one may finish the spot by polishing out with lighter strokes, ending with the grain. If it is a large spot, polish the rest of the immediate surface to match. If the surface is to be satin or dull, brush out with a dulling brush and FFF pumice stone before it dries and immediately after finishing the French polishing. This dulling operation is described fully in Chapter V.

Water spots vary as to age, and the longer water is allowed to stand on a surface, the deeper will be the white, opaque film, and of course the more difficult to remove. Small spots can be frenched out with the rubber and suitable material. Large spots can usually be removed by spraying over the spot with a material recommended for this use. Do not confuse water marks with a cloudy finish, such as is seen so much on lacquer finishes. Lacquer finishes, if correct, are not affected by water, but are frequently gray, or nearly white, for several reasons as explained below.

## CLOUDY OR GRAYISH FINISHES

Many things can cause a cloudy finish, such as bleeding of stain through the finish, pigment stain, instead of a clear transparent aniline, fading of the coloring matter in filler, or improper balance of solvents in lacquer. The bleeding of stain in filler and the unbalanced formulæ in lacquers are the most common causes.

*Unbalanced Lacquer Formulæ.*—The manufacture of nitrocellulose or pyroxylin lacquers are of only a few years' standing, with constant changes, chiefly to make a cheaper product, to meet competition and yet come within the field properly called pyroxylin lacquers. Some of these changes, while making a cheaper product, are not conducive to a lasting finish, and by substituting new solvents for old ones, cause blushing. Most of this blushing is caused by the addition of too much alcohol to the formula. This will also cause the cotton film to be thrown out of solution, and show a cloudy or cracked appearance.

*Cloudy Surface from Filler.*—A cloudy or grayish finish is very common in lacquer. In the great rush to turn out work at record speed, and thus cut down cost in labor, some very bad results have been produced. Only one thing can happen to filler under lacquer to produce a cloudy surface and that is the bleaching out, or bleeding, of the coloring matter in the filler, leaving the filler gray in the pores. Recently filler, containing stain, has been used for shading and the lacquer applied over this. The result is that the stain in the filler bleeds into the lacquer and leaves the filler gray in the pores. This can be avoided by using a spirit stain for shading over the filler and after it is thoroughly dry. The best method of shading is to use water stain and then do the high-lighting afterward.

*Removing Cloudy Surface.*—It has been proved that, regardless of the reason for a cloudy surface, grayish appearing spots on finishes can be restored to a clear finish by using amalgamaters or a material recommended for water marks and varnish checks. First, sand the surface with 3/0 waterproof garnet. Any of these materials can be flowed on with a brush and the most of them are thin enough and well adapted for spraying. Some few surfaces may be restored by French polishing, but this is not recommended as the proper method. If one is to brush on the amalgamater, care must be taken to have the surface horizontal if possible and lay the material on as heavy as possible without danger of running. If a spray is used the material can be flooded over the surface and leave a very smooth finish with no brush marks. Care must be used to prevent laps and runs, for places made uneven in this way prevent a perfect finish later on.

*Finishing.*—After flowing on or spraying any kind of amalgamaters, the work from there on depends on the kind and quality of finish desired. One can dull an even surface after twelve hours with 2/0 steel wool, or the surface can be dry sanded with 5/0 garnet finishing paper to a smooth finish and another coat of lacquer or varnish applied, depending on the original finish. After this coating it can be rubbed with pumice and oil to any desired texture.

As mentioned previously, several things may cause a cloudy surface, and it may happen that it is not any of the causes mentioned in this treatment. For this reason you may not be able to remove the grayish appearance by flowing any material over the top coating. If the above methods do not give results, it is best to remove the finish and build up again according to approved standard methods, outlined in Book II.

## INK STAINS REMOVED

Although very simple to remove, ink stains are bothersome. The time the stain has been left on the finish governs the method used for their removal. When little finish is on the furniture, as in the case of old school desks, it is next to impossible to remove ink stains. Most all inks are made from aniline water soluble dyes and, of course, are very penetrating. A little soap and water will remove the spots that are fresh on a varnish or lacquer finish, by rubbing with a cloth. Spots that cannot be removed in this simple manner will sometimes yield to a weak solution of butter of antimony in water, shaken up and rubbed over the spot vigorously with a cloth. Other spots will not yield unless rubbed out with pumice stone and water, the pumice cutting up the surface and the water dissolving the stain. If the spots are stubborn, they can be sanded out and then the surface French polished with amalgamater or French varnish, as outlined for water marks in the beginning of this chapter.

When the stain has penetrated into the wood and none of the above methods will remove the stain, there is nothing to do but try some of the bleaching processes, outlined in Book II.

### PERFUME AND ALCOHOL STAINS

Stains caused by perfume or alcohol are very common. Alcohol softens the finish and generally there is an imprint from some article pressing into the finish. Few finishes will withstand alcohol. Where there is nothing to press into the finish, the spot will be like a blister, smooth and glossy, but raised above the surrounding finish. Where a scarf or doily has been pressed into a surface softened by alcohol and pulled away when dry, and this damage is over any considerable portion of the surface, sand down with 3/0 garnet finishing paper, clean, and flow on an amalgamater, after which finish in the usual way by coating over with varnish or lacquer as desired and rubbing down.

Most damages under this heading are slight and can be French polished after sanding. The method used in repairing these spots by frenching is the same as used for water marks. One must be careful to use a block for sanding and have the surface level before frenching or the spot will be plainly visible when finished.

*Burned or Blistered Surfaces.*—The damages under this heading are of various degrees of seriousness. A blister from a light-bulb can be easily repaired by sanding down the surface and French polishing with, perhaps, a little staining. Blisters from sun through a plate glass window are more serious. If the piece is blistered to any considerable extent, it is best to remove the finish and apply again, for the sanding and frenching require more time than to do over any considerable surface.

When a surface has been burned with an iron or from being close to a stove or otherwise, it is a very serious thing to fix. If the wood has been burned any at all, the surface must be removed and sanded, cleaned perfectly and refinished. If the burn is only slight, the surface can be sanded smooth and french polished to a level with the surrounding surface, stained if necessary, and matched.

# CHAPTER VII

## REPAIRING ENAMEL AND PIGMENT LACQUER

THE damages under this heading present a real problem to the patcher. When these finishes were first brought out, they were repaired by using a spirit enamel tinted to different colors. Of late, however, finishers use lacquer enamel to make such repairs, though the first process is still used.

White enamel or lacquer does not present quite so difficult a problem as the colored finishes, and can be repaired by using either the white spirit enamel or white lacquer, depending on the kind of finish. The lacquers cannot be used to repair enamel surfaces, as they will check a finish containing oil. On the contrary, the white spirit enamel can be used on enamel and lacquer finishes, and for that reason has become the most popular material for patching these finishes.

*Patching with Spirit Enamel.*—White spirit enamel is supplied in white or ivory, also other colors. Tinting colors, pigment colors and spirit aniline solutions may be mixed with the white spirit enamel to make any desired shade.

*Matching Colors.*—Yellow will always make ivory by adding small proportions to white. A very small amount of red or more liberal proportion of orange can be added to match a particular ivory, especially if a lemon yellow tinting color has been used. The yellow must be added in a liquid or semi-liquid state, thinning down if necessary before mixing, and the mixture must be stirred thoroughly before testing. Many mixings and testings must be made before the exact shade is produced. If much ivory patching is done, make a deep shade of ivory in a glass jar and mix with white for lighter shades when ready to use.

*Blue Enamel.*—To make blue enamel, tint white enamel with the blue enamel tint. The addition to the mixture of a very little yellow will throw the shade to a greenish cast of blue. The addition of red will give a purple hue.

*Green Enamel.*—By adding yellow first and then blue one can produce a beautiful standard green, or vary from yellow cast to blue cast, as the case may require. Black is sometimes needed to produce the right shade.

*Red Enamel.*—Tinting red must be a bright red and not contain any orange. A bright red from fuschine crystals, dissolved in alcohol, will produce a very good bright red and can be darkened by the addition of black tinting color. From a deep, bright red, pink or any tint of red can be obtained by the addition of white spirit enamel.

*Secondary Colors Produced.*—One can produce orange by combining red and yellow in different proportions. Brown can be produced by adding sufficient black to red, although this is not considered a secondary color, but a deep shade of red. Red and blue tinting colors mixed will produce purple or violet, according to the proportions, and can be shaded or tinted by the addition of black or white. Normal gray (black and white) can be made into colored grays by taking red for russet, blue for olive, yellow for citrine, etc.

## TINTING LACQUER ENAMEL

The foregoing explanation will suffice for mixing the same colors in lacquer pigment enamel as spirit enamel, except that the tinting colors should be nothing but pigments ground in japan and thinned in japan before mixing with a pigment lacquer enamel. Remember that lacquer enamel is a nitrocellulose mixture with pigments and that normal spirit aniline tinting colors would not be permanent or suitable.

*Japan Colors in Clear Lacquer.*—For almost every match job on lacquer work, the addition of colors ground in japan to a clear nitro-cellulose lacquer will suffice for patching or coating over the original pigment lacquer. Of course, if a tint of these colors is desired, it is necessary to add white pigment lacquer to the mixture or begin with white instead of the clear lacquer. Therefore use a clear lacquer with addition of colors for dark shades of colors and use white pigment lacquer as a base for producing tints of different colors.

*Preparing the Damaged Spot for Patching.*—In all cases of damage to enamel or pigment lacquer surfaces the finish is either chipped out, scratched or rubbed through. Other kinds of damages require refinishing of the surface because they are too general and require too much time in patching. Remember that the most of the time consumed in patching these places is used up mixing the colors to match perfectly, and for that reason patchers try to get the original enamel or lacquer, and prefer to allow twenty-four hours for drying before finishing, rather than spend time trying to match a gray, for instance. It is best never to sand a spot unless a scratch has raised the wood above the surface coating. If the wood has been raised it is best to cut it off with a scraper or knife and avoid sanding if possible and thus prevent cutting through the finish coat and expose undercoats.

### BURNING-IN WOOD CEMENT

In deep scratches and holes or indentations it is much faster work to fill them in with woodturners' cement, commonly called shellac sticks. These sticks can now be had in all the known shades or colors, and are even made to match the tints in enamel or lacquer. It is seldom that these sticks match exactly the piece you are patching, and for that very reason are not used as much as they could be. A deep hole can be filled very quickly with the cement nearly to the surface and then filled the remainder of the way with spirit enamel or pigment lacquer and surfaced.

Use the directions for burning-in, the same as outlined in Chapter IV, under the heading, *Filling Deep Scratches*. One must have an absolutely clean knife and use nothing but a good grade of alcohol in the torch, or else use an electric knife or heater in order to avoid discoloration of the cement. Much care must be used not to destroy the resiliency of the cement by overheating. Fill as soon as the cement will run.

*Filling With Spirit Enamel or Lacquer.*—Touch-up brushes, commonly called "penciling brushes," made in different sizes and lengths, are used. A short-handled brush of camelhair, with about one-inch bristles and known as No. 5, is the kind of brush most commonly used for filling in with spirit enamel or lacquers. When narrow stripes or small spots are to be filled, use a small lettering or striping brush for the purpose.

*Testing Material for Color.*—The most important thing before using the color is to be sure that it matches the finish to be patched. This cannot be told by sight, but a series of tests can be made readily and quickly that will suffice to give an accurate test. Have ready about six small vials with large mouths, and when you have found the shade that comes nearest your piece, place this in vial one and then add a very small amount of white to two or three of the vials, increasing the amount of white in each. Do the same with addition of black in very small quantities, increasing in each. This test will usually find the correct tint or shade, but frequently it will be necessary to add some of the primary or secondary colors in small proportions to the original mixture in order to get the correct shade or tone.

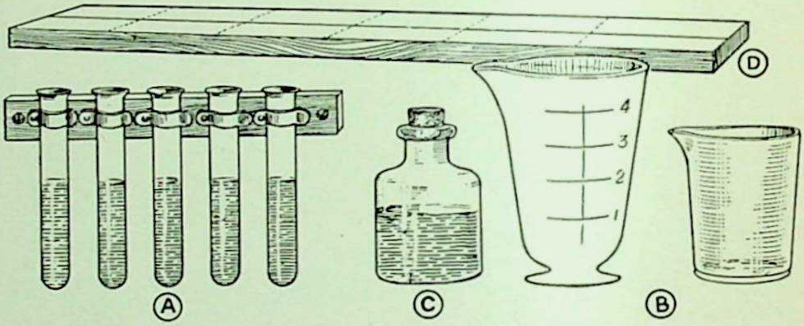


**Plate XIX.—(A) Test Tubes for Testing Pigment Color for Tinting Enamel; (B) Graduate Glasses; (C) Glass Jar; (D) Wood Chips for Testing Color.**

After these vials are prepared with the different tints and shades, number them, and then number a like number of small wood chips or panels or a series of numbers on one piece and to this piece apply a small amount, heavily covered, of the prepared color from each vial under the numbers corresponding to each vial. No brush should be used as this will mix the tints or shades and will render the test useless. When the colors have dried you can usually find the correct one. The vials should be kept corked, otherwise evaporation of the volatile ingredients will make a deeper shade.

One should always prepare enough of these different shades for the work in hand, as the testing process is tedious and requires time. The test is not accurate unless at least two hours have elapsed after the test has been put on the test panel for drying. Regular test tubes, placed in a rack made with holes for the tubes, will pay in any establishment. Tests that are accurately compounded can be transferred to glass jars with airtight lids for future reference or use on the same finish.

## GROUND COAT

When there are large spots to repair, it is best to apply a ground coat of a near-match color before applying the finish patching material. This will give a good idea as to the match of the material. The test panel should be viewed in the same light as the piece to be patched for accuracy.

## BRUSHING-IN ENAMEL OR LACQUER PATCHING

The proper consistency for material in lacquer or enamel patching varies according to the work in hand. For deep filling with the brush one cannot use a material that runs readily, and for shallow places, a heavy, pasty liquid that would pile up to any great height on the surface is not suitable. The material, in any case, must be heavier than finishing material to be applied with a brush over an entire surface. It is better to have it a little too thick than too thin, as a run over the other surface is hard to eliminate, for any of this material will attack the other finish as soon as applied.

After the match is perfect and the ground coat has been applied, or the spot burned-in with cement as previously described in this chapter, dip in the penciling brush and apply

Plate XX.—Penciling in Damage on Colored Lacquer or Enamel with Brush.

a small amount at a time until the place is filled to a sure surface above the surrounding finish, so that when it is shaved or sanded down it will not be lower, thus necessitating another application.

Much care must be exercised in applying the color so that it will not run out of the place being filled, especially if the piece is in a perpendicular position. It is better to have all surfaces in a horizontal position, if possible, and in this way eliminate runs. If a little time for drying between coats is allowed, runs are few and the surface will build up easier.

Very little brushing should be done as this will tend to spread the material instead of concentrating it on the spot. Just allow it to run off the brush in limited quantities and repeat until filled above the level. Be careful with lines or narrow scratches and use the proper brush. Stubby brushes should only be used where large spots are to be filled and to release more material.

*Matching Surrounding Surface.*—After the surface of the fill has dried thoroughly hard it is necessary to shave it down even with the other surface. The shaving can be done with several different tools. One of the best tools for this use is a stub edge of an ordinary wood scraper. One about one inch wide will suffice for smoothing down most of the fills on enameled or lacquered surfaces. In smoothing down care must be exercised not to scratch the surrounding surface, as this will necessitate another repair job.

The real matching of all surfaces in color is the exact color, but the texture of the finish must be the same, and for that reason it is necessary to rub the spot down with a thick felt pad until it is of the same appearance as the rest of the surface. Try using pumice stone and oil, FF or FFF, with perhaps the addition of a little rottenstone powder, if a brighter finish is desired. Sometimes it is necessary to rub the whole surface lightly in order to have a good matched texture to the finish. Use care in rubbing the surface that you do not cut through and spoil the job.

*Contingent Coatings.*—If for any reason one has spoiled the repair by having an imperfect match, refill the spot after taking out the filling or else cover the entire surface with a coating of regular enamel or pigment lacquer or clear lacquer tinted with colors and japan. These coatings are allowed a few hours to dry hard (in case of enamel, allow forty-eight hours drying before rubbing) and then rub down.

### GRAINED EFFECTS IN PATCHING

This is introduced at this time for the reason that much of the metal office and bedroom furniture is considered under the heading of enameled finishes. Graining is necessary to imitate mahogany, oak or walnut on this style of furniture. Many hotels are equipped with metal furniture. Much of the modern office furniture, file cabinets, etc., are enameled and grained to produce beautiful effects. Many of these finishes are baked on and are therefore difficult to damage, but for the same reason, they are difficult to repair when damaged.

When small places have been chipped out the repair can be effected by burning in a like color of wood cement, but if the damage is large it will be better to follow the outline in repairing enamel surfaces and building up with spirit enamel tinted to the desired shade. The most difficult part of this operation is the smoothing down of the patching material without removing the graining on the ground coat.

*French Polishing Method in Graining.*—By sanding the surface, which is never thick, one can feather out the edges of the damage until the spot is very smooth. Build up the spot by using French varnish on a rubber as outlined in Chapter V under the heading, *Rubbed Through Places,* and apply aniline spirit stain of a color or colors to match the lightest or ground coat of the finish. After the spot resembles the ground coat, continue to apply stain of a darker shade to make the grained effects match the surrounding surface. Be sure to apply the stain with the finger and keep the surface just soft enough to hold the powder stain when applied. Dull the surface just after matching with a dulling brush with pumice.

# CHAPTER VIII

## PATCHING SPECIAL FINISHES

THIS chapter deals largely with the special finishes in Book V, and some of the finishes mentioned in Book III. Such finishes, as applied to turned objects, cedar chests, refrigerators, kitchen cabinets, radio cabinets, breakfast room furniture, grained or enameled furniture, office furniture, chairs or any other finishes, are dealt with in the preceding chapters of this book.

### GOLD BRONZE FINISHES

There is only one efficient method of patching a plain, gold bronze finish. The best example of this type of finish is the old Vernis Martin bed finish. Many small pieces of furniture are decorated with gold bronze in frame gold or burnishing bronze, and require about the same general treatment. When a place has been disturbed on a plain bronze finish it is necessary to smooth this out by sanding with 6/0 garnet finishing paper and wipe with a dry cloth. Use a small mouth-spray and insert it in a small bottle of japan bronzing liquid, blowing just sufficient liquid on the spot to make a good coverage. Allow this liquid to set about one minute and be sure there are no runs. Take a little of the gold bronze of the correct shade—mixing a deep gold with a pale gold is sometimes necessary to match—and blow the bronze from the hand onto the spot. If properly done the bronze will adhere to the spot and be perfectly smooth and evenly distributed. After about thirty minutes, blow over this a little bronzing lacquer, banana oil, or if finished as a whole with nitro-cellulose lacquer, use that as a spray. Lacquer spraying must be done quickly, and the lacquer must be reasonably thin for good smooth results, without lapping to any great extent over the other finish.

### BURNISHING BRONZE

The application of burnishing bronze can be accomplished in the same manner, except that the bronze coating must be reasonably heavy to allow for burnishing with an agate tool. After the bronze has firmly set in the sizing, the tool is rubbed over the bronze until the correct brilliance has been produced. The most essential part of patching this finish is the correct shade of bronze.

### METAL LEAF PATCHING

Gold or silver metal leaf patching is quite difficult, due to the fact that one is apt to have wrinkles in the leaf when laying it on small spots and in pressing it out quickly, thus spoiling the job. Select the proper metal leaf and follow directions above in blowing on the liquid with a mouth-spray. The liquid should be allowed to dry until almost hard—just tacky enough so that the leaf will adhere firmly. Lay a piece of gold leaf on the pillow (all metal leaf should be laid from a small pillow, similar to a pin-cushion and filled with cotton wool) and apply with a small brush to the tacky sizing. The leaf is then allowed a few hours for drying, after which any surplus is removed. In most cases a lacquer of some kind is sprayed over the spot for protection.

Glue size is also used but this is not recommended in patching as it is difficult to remove from the rest of the surface without injury to the finish. In using the burnishing tool over the leaf, press the little finger over the agate, holding the handle firmly in the hand and passing over with much pressure. Do not lift the tool until the desired lustre is obtained.

*Glazed Bronze Effects.*—It is frequently necessary, as in the case of antique-glazed picture frames, etc., to flow over a coating of colors in japan and wipe off almost entirely (if a novelty moulding where the color adheres to recesses in the moulding).

If the surface to be patched is large use colors in oil. In the cheaper antique bronze finishes one can mix dry pigment colors with the bronze powder in a japan liquid and spray over the spot after it is leveled or smoothed. In case it is necessary to fill a deep hole before bronzing, fill with water putty, plaster paris, or wood cement.

*Polychrome Bronze Effects.*—This finish consists of several coats of bronze powder of different colors, blended together. Select all the different colors of bronze powder used in the original finish and mix with bronzing liquid, each color separately, in a very small container—say a two-ounce bottle—and using the mouth-spray, deposit a thin coating of each color. Allow about ten minutes for each coat to set before applying another. Sometimes it is necessary to rub a glaze over this, when absolutely dry, and wipe off to match.

## ANTIQUE GLAZE PATCHING

Over many different types of finishes, besides bronze finishes, will be found a glaze coating of umber or sienna, raw or burnt, and the method of patching depends on the undercoating. If the undercoating is enamel it is, of course, necessary to match the color by adding enamel color tints to a white spirit enamel. The method of matching is shown in Chapter VII. When the under surface has been smoothed down level, brush over the glazing color and wipe off where desired to match.

If a glazed surface is over a dark background, it will only be necessary to match the ground coat with spirit enamel, tinted to correct color, and the same operation of shading of glaze color over this. On rough metal surfaces little difficulty will be encountered in patching with the above materials.

## COLORED ENAMEL LACQUERS

Wood cement of all colors is available to match the new bright-colored lacquer finishes. The Chinese red stick is made in two colors and a blending of the two will frequently allow a good match. The same is true of the blue and green cements of different shades. These cements are burned into the indentation or damage and smoothed down with an asphalt naphtha on a piece of felt to avoid disturbing the rest of the finish. Of course the cement should be leveled down to the rest of the surface as much as possible without burning the finish. Garnet paper, 7/0, is used for this sanding. Pumice stone and oil on a felt can be used if the surface is first made nearly level, and with dulled finishes, this will complete the repair provided the match is good. In case the piece is high-polished, the spot can be leveled with garnet paper dry, and a small amount of clear lacquer or colored lacquer can be blown on with a mouth-spray from a small container. Many of the lacquer enamel finishes must be patched with spirit enamel or lacquer enamel of the correct shade. The same process of mixing lacquer enamel tints with the white lacquer is used as with the spirit enamel only special tints are prepared for the lacquer enamel.

When a satisfactory base of cement has been burned into the indentation and smoothed down, spray a matched lacquer over the spot with the mouth- or hand-spray. It is sometimes necessary to thin down the lacquer enamel with the thinner in order to have it sufficiently thin to spray. Always use the thinner made by the manufacturer of the lacquer enamel for the reason that the solvents in the thinner should be in the same proportion as the solvents in the lacquer, and when they are thus balanced, the lacquer can be thinned to any consistency.

While it is most economical to use the tinting colors for the lacquer enamel, if one has sufficient work of this kind, he can use selected tube colors ground in japan and mix with the lacquer enamel or clear lacquer to obtain the correct match for patching all lacquer enamel finishes or polychrome finishes decorated with lacquer enamel.

### STIPPLED FINISHES

Sometimes it is only necessary to soften the coating and restipple a finish that has been roughed up or damaged. If the coating is enamel, an amalgamating liquid can be sprayed or brushed lightly over the surface to be patched and allowed to set almost dry. If the finish is shaded, a spirit stain in liquid, previously prepared, can be sprayed over the spot with a mouth-spray, or hand-spray for larger surfaces, and then stippled with a brush just before it dries hard. The same results can be had on all lacquered surfaces, and if the amalgamater does not soften the lacquer sufficiently, add a small amount of thinner to it and proceed to repair as above.

## BAKED ENAMEL FINISHES

The fact that these finishes are baked and very hard does not present any great obstacle in repairing. White spirit enamel is ideal for patching the white or any colored enamel surface as this material with tinting colors can always be obtained. The only possible objection to the white spirit enamel is that it may discolor with age, whereas the baked enamel will remain about the same in appearance. The white lacquer enamel perhaps is best for the extremely white finishes, and will perhaps stand heat or water better on some pieces. The spirit enamel must be applied with a penciling brush and applied one coat over the other until the spot is filled, and then sanded down and frenched with some frenching material on the rubber to bring out a high gloss. The lacquer enamel is applied in the same way and can be polished in the same manner or with a polish prepared for lacquer. Cement should never be burned into these places, as it will only break out at the slightest touch. It does not adhere to a baked surface as it does to a regular finish.

# BOOK V

# Special Finishes

# BOOK V

## CHAPTER I

### TURNED OBJECTS: CANDLE STICKS, LAMP BASES AND SMOKER STANDS

THE most economical production finishing method for turnings in a stain finish calls for a dip tank and a lathe. The first step is to examine the pieces for porous end grain, which if encountered, should first be sealed to prevent the stain taking dark at these points. If oil stain is used, the sealer may be one part raw linseed oil to sixteen parts benzine; for water stain a thin glue size, applied with either a brush or sponge to the end wood only. When dry the turning is then mounted on the lathe and sanded with the paper cupped in hand while revolving at a good rate of speed, first with coarse paper *against* the grain, then with finer paper *with* the grain.

*Staining.*—If it is to be water-stained, the wood should first be sponged with warm water in which a little glue has been dissolved to stiffen the raised fibers, then sanded down again on the lathe with fine paper as soon as dry, after which it is dipped in the stain and set up to dry. If it is desired to high-light, the piece is placed on the lathe and lightly sanded on raised parts; in the case of oil stain, a cloth is held against the wet stain. Water stain is naturally preferable to oil stain, particularly where a mahogany color is concerned, but oil stain is often made to serve for cheaper work.

*Sealing.*—When dry either water or oil stain should be sealed and this is done by dipping, brushing or spraying on a thin coat of shellac or shellac substitute, about one pound-cut over water stain and two pounds over oil stain. The shellac should be lightly sanded on the lathe in the case of water stain, using fine paper and taking care not to cut through to the bare wood on edges. Fine excelsior will serve satisfactorily in place of sandpaper if the shellac is over oil stain. On very cheap work filler is applied directly over the water stain, but this should not be done with oil stain.

*Filling.*—Mahogany, walnut or oak require at this point a paste wood filler, reduced for dipping about eight pounds to the gallon of benzine, for brushing, twelve or fourteen pounds. As soon as the filler has flatted, in fifteen or twenty minutes, the piece is placed on the lathe and the surplus wiped off by holding burlap or sea-moss against the grain while the lathe revolves slowly, so as to pack the filler well into the pores.

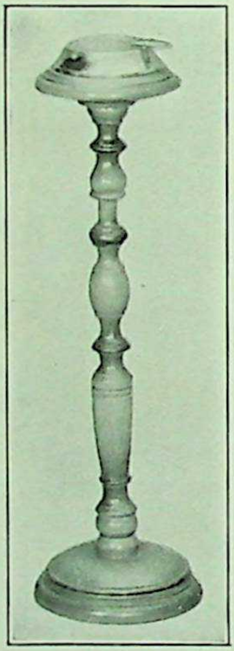


Plate I.—Turned Smoking Stand, Painted, Shaded and Varnished.

Plate II.—Turned Smoking Stand, Stained and Varnished.

*Surfacing.*—In eighteen to twenty-four hours the filler may be sealed with another shellac coat, as above described, or the finish coats may be applied direct. Shellac is best dipped only on small turnings; larger ones should be sprayed or brushed.

*Finishing.*—Much the same is true of the application of varnish or lacquer for the finish coats, one coat of the former and two of the latter. For rubbing the piece is placed on the lathe holding a pad of waste in the hand sprinkled with paraffin oil and FFF pumice; if it is desired to polish in addition, wet the pad with tripoli, rotten stone and furniture polish, cleaning off with fresh waste. The lathe should revolve swiftly, progress being noticeable by moving the pad to one side—the slush is largely thrown off by the revolutions. A flat rubber can be used to French polish with French varnish over shellac coating—apply rubber to piece dampened with French varnish while turning—shellac can be applied in this way also. On cheaper work, especially gum and birch, the turning is simply stained, surfaced with shellac and waxed, paste furniture wax being held against the revolving piece on a cheese cloth pad. In about an hour the wax can be polished with clean waste or an additional coat applied.

*Polychrome.*—Many wood lamp bases are polychromed, metal-leafed and bronzed, the processes for which are described in more detail elsewhere. The wood for lamps is usually poplar or basswood to which a sealer is first applied, consisting of several coats of either dry colors in heavy shellac or a mixture of whiting and dry Venetian red in thin glue, brushed on. Over this japan gold size is brushed, followed when tacky by gold leaf, burnished with the tool. The sealed parts to be polychromed are painted with bright green, red, blue and yellow japan colors reduced with turpentine, antique glazed over when dry with Van Dyke brown in japan thinned with benzine. This is wiped off while wet from high lights and into deep parts, protected when dry with clear lacquer or pale varnish, rubbed dull.

*Carved Turnings.*—Where carvings are present the dipping process may be retained, but all other work must be done by brush or spray as the lathe becomes impracticable. This also applies to polychroming which is chiefly handwork anyway.

# CHAPTER II

## LAMP SHADES

C*LOTH Shades Glacé.*—Several different grades of cloth are used in lamp shade manufacture, ranging from ordinary cheesecloth to finer fabrics. After being sewed to the frame, the cloth is trimmed and the whole rolled or dipped in lamp shade varnish, outside and in. If the fabric is smooth, the shade takes on an amber, glass-like tone; if coarse, the threads stick out in the manner of Turkish towelling and yield a softly diffused light. The varnish is a special one, made to give the proper color tone without rotting the fabric with age, and is readily obtained from most manufacturers. One or two coats may be applied according to the quality of shade, twenty-four hours being allowed for recoating or packing. Both the smooth and rough finish is usually decorated, either in free-hand or stencil designs, the latter shaded and filled in. This work is best done by an artist using oil tube colors.

*Cloth Shades, Crystal or Beaded.*—The method is the same as above given except that after the decoration a further coat of varnish is applied, which while wet is rolled on a bed of ground glass beads, mica or smaltz. The beads come in fine, medium and coarse grades and may also be sprinkled on with a device like a large salt shaker. When the varnish has dried, the excess is brushed off, the resulting roughness not only diffusing the light agreeably, but softening the outlines of the decorations and giving them a misty appearance.

*Parchment Shades.*—Where not already dipped in thin linseed oil, these are given a brush, dip or spray coat of white shellac, about two-pound-cut, then hand-decorated with oil tube colors, stenciled with japan colors or given a design by decalcomania transferring. Over this is applied a coat of pale varnish.

A tracery or cobweb effect may be procured by substituting clear lacquer for shellac, then spraying on a coat of transparent crackle lacquer which does not dry as quickly as regular crackle lacquer enamel, but which may be speeded up with a low heat. This may be decorated as above described, protected by pale varnish or one or more coats of body lacquer when the decorations are thoroughly dry.

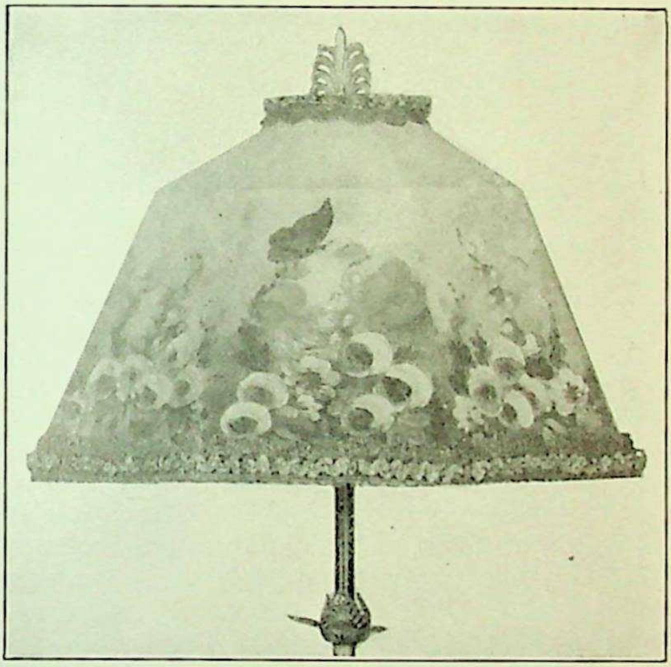


Plate III.—Beaded Cloth Shade, Hand-Painted.

*Shades for Piano and Bridge Lamps.*—Where the light of the lamp is to be thrown down rather than generally diffused, the lamp shade may be painted or decorated in darker colors. Thus over the first coat of varnish a coat of black flat enamel may be applied as a base for decorating with a design marked off at regular intervals permitting the light to shine through sideways. Or lacquer crackle enamel in black or colors over clear lacquer will give a tracery effect operating on the same principle. The latter is best given a matte protective coat of flat lacquer.

## CHAPTER III

### METAL LAMP STANDS

METAL bases are usually assembled from hollow piping, cast iron or aluminum bases, wrought iron and brass. With respect to finishing, this is largely covered in the chapters on *Metal Leaf*, *Gold Bronze* and *Polychroming* in Book III.

The metal, of course, must be rendered entirely free from grease or oil and smoothed unless a texture finish, as with raised stippling, is desired. The metal is customarily given a first coat, for sealing and binding purposes, of shellac, about a two-pound-cut, either white alone or mixed half and half with orange, followed while still wet by cheap gold leaf daubed on with a cloth pouch, the lathe being revolved slowly by hand.

Directly on the metal may be applied gold bronze in varnish or lacquer bronzing liquid, preferably the latter for greater clearness and lustre, oil or japan gold size for a high-grade metal leaf finish, paint or lacquer stipple paste for a texture finish, paint, color varnish or lacquer enamel for a solid color finish. All will adhere well if the materials are properly prepared and applied and may be brushed, sprayed or dipped according to the shape and size of the base. There is no objection to omitting shellac in favor of flat paint or lacquer undercoaters for finishes in solid color if this be preferred, but these primers should be specially made for use on metal.

The variety of finish effects suitable for metal lamps is almost without limit. Sometimes the entire lamp will be gold-leafed or bronzed and antique glazed; again the base and top portion alone will be so treated, the pipe portion being raised stippled and color glazed or finished smooth with paint or lacquer enamel and antique glazed, or color varnished over a flat paint undercoater, rubbed dull and polished to a high lustre. Where an ornamental vine and leaf design is found, the practice is usually to polychrome these by hand with japan colors in nature's own colors, antique glazing and protecting with a coat of clear varnish or lacquer.

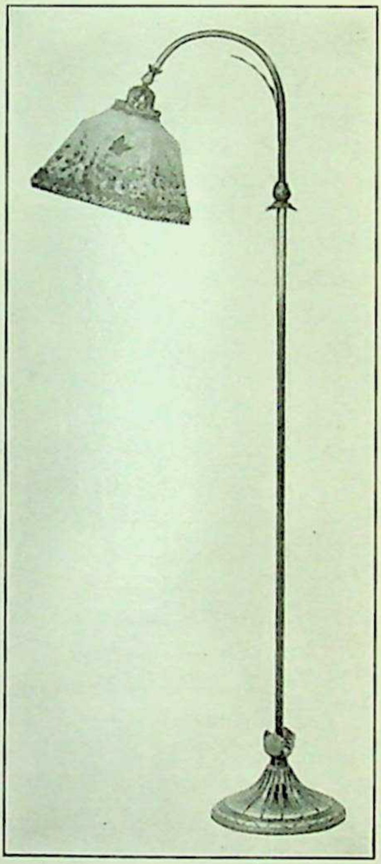


**Plate IV.**—Lacquer Enameled Metal Lamp Stand, Dark Blue Shaded over Gold, the Base Japan Color to Match and High-Lighted, the Whole Protected with Clear Lacquer.

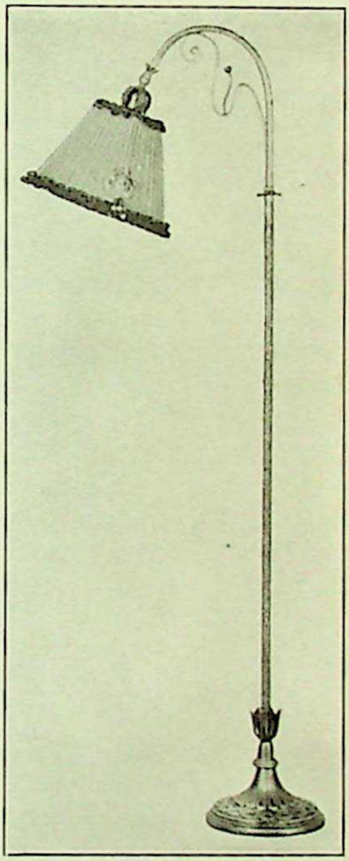


**Plate V.**—Metal Lamp Stand, the Pipe Spray Stippled with Lacquer Paste, the Base Gold-Bronzed, the Leaf Designs Polychromed, the Whole Antique Glazed and Protected with Clear Lacquer.

## CHAPTER IV

## CEDAR CHESTS

CEDAR chests as produced today are intended in large part to offer a decorative appearance as well as to afford moth-proof storage for furs and woolens. In consequence of this it is necessary to be familiar with three types of finish which are described herewith. In all cases no finish whatsoever is applied to the interiors and that on the exteriors serves the additional purpose of helping the aromatic qualities of the wood to be concentrated inwards.

*Natural.*—Where the chest is to serve a primarily utilitarian purpose, the finish is applied directly to the bare wood which is of a red and white streaked character. In order to harmonize the red more closely with the white it is customary to tone the latter to a pinkish shade by means of Venetian red in oil, reduced thin with benzine and applied with a rag. The next step is to inspect the surface carefully for knot holes which, when found, may be filled by burning in with stick shellac, sanded off smooth and level. The shade of stick shellac should blend with the color of the knot, generally a deep reddish brown. A simpler method is to shellac the hole, then make up a sort of fluid paste prepared by mixing rose pink and Van Dyke brown dry colors in varnish. This is knifed in the hole with a putty knife, cleaning off well around the edges, with a benzined cloth if necessary. It can be sanded smooth the following day if the varnish is a quick-drying one, or use water putty.

The next operation is to spray or brush on at least two coats of two-pound-cut pure white shellac. This shellac coat is essential, for despite much experimentation, nothing else has been found which will as effectively seal up the cedar oil exuded

shellac
sealer

by the wood. Moreover the shellac must be strictly pure—adulteration with rosin, copal or other gums will lessen its value and very likely result in a streaked finish, uneven as to lustre. It therefore goes without saying that shellac substitutes, varnish first coaters and the like cannot even be considered next to the wood.

With the drying of the shellac coat it is sanded smooth and finished with one or two coats of rubbing varnish or body lacquer, the latter sprayed, the former brushed or sprayed. The number of coats and quality of varnish or lacquer depends on the selling price. The cheaper grades are often given but one coat of varnish, rubbed only on the lid; the more expensive types are given two coats of varnish or three of lacquer, the last rubbed, on the top and front, with flat varnish or flat lacquer on the sides. Decorations are applied over the shellac coat and under the varnish or lacquer coats.

Plate VI.—Cedar Chest in Natural Finish with Ornamental Applied Carvings.

lacquer
&
varnish

A peculiarity of natural finished cedar chests lies in the fact that on some the finish will seem to die away, as if by suction into the wood, in as little as six months, whereas other chests, finished identically, will show excellent body and lustre four or five years later. No adequate explanation for this phenomenon has ever been evolved, unless it be varying amounts of oil in the cedar.

*Veneered.*—For reasons previously stated, it is impractical to apply anything to bare cedar but shellac, beside which the strong red coloring and tight grain make the use of stain or filler or stained shellac out of the question. Thus, in order to make of a cedar chest an article of furniture which will blend with neighboring walnut or mahogany pieces, it is necessary to apply veneers of these woods to the cedar. This is done over the entire exterior, and then it is finished exactly like any cabinet work similarly veneered and may be considered, for finishing purposes, as walnut or mahogany furniture lined with cedar.

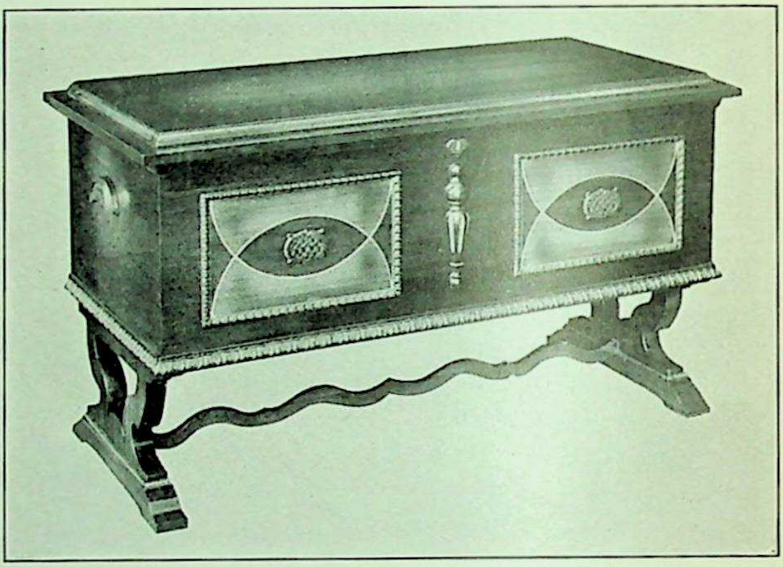


**Plate VII.—Cedar Chest with Walnut Veneer Exterior, Shaded, Two-Toned and Gold Bronzed on Border Mouldings.**

*Painted.*—The preliminary steps are the same as for a natural finish. Following the shellac two or more coats of oil undercoater and oil enamel may be applied by brushing or spraying.

The same number of coats of lacquer enamel may be substituted if a speedier finish is desired. Decorations are applied over the last coat, protected with pale varnish or clear lacquer. In fact the system after the shellac is the same as for enamel finishing on any kind of cabinet work.

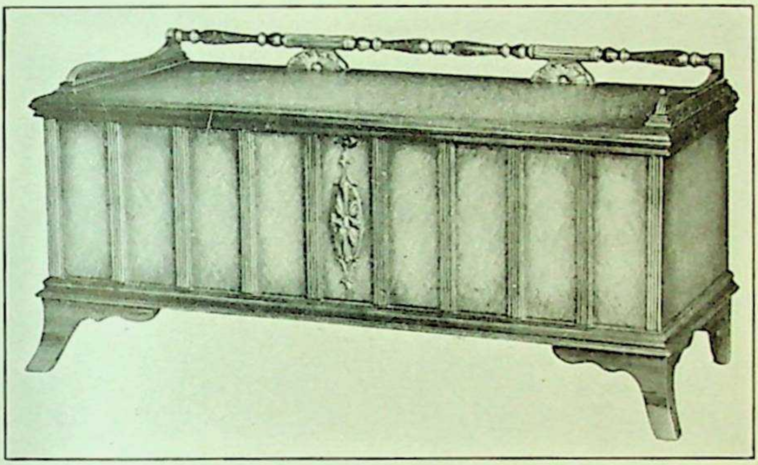


Plate VIII.—Birdseye Maple Veneered Cedar Chest with Shading in Sections on Front.

# CHAPTER V

## REFRIGERATORS AND KITCHEN CABINETS

TIME was when all ice boxes were finished in golden or antique oak with interiors of natural galvanized iron. The modern refrigerator is more apt to be made of steel throughout, finished internally in white and externally in white or gray, particularly the latest models of electrically refrigerated boxes. Nevertheless there is not yet complete uniformity, either in materials or methods, as will be seen from the various systems outlined below.

### METAL INTERIORS

*Preparation.*—Where the lining is of galvanized iron, a preliminary chemical wash will cut the oily film and assure proper adhesion of the first coat. Of the various available solutions, the most convenient and effective is obtained by mixing one part acetic acid in forty-nine parts water, applied liberally with burlap or a flat bristle brush. Following this the metal should be rinsed with a sponge dipped in clean warm water. As soon as this has been wiped dry, the first coat should be applied at once. Where the lining is steel a benzine wash will suffice.

*First Coat.*—This may be a red oxide or light gray primer to be baked at about 300° F. for one hour, or a special clear long-oil article called "bond coat." It is very elastic, anchors the finish as a whole and should be reduced to thin consistency with naphtha for spraying or with turpentine for brushing. The addition of a little white primer serves to act as a guide in detecting any skipped spots and a partial hiding primer coat. It may be baked at about 175° F. for two hours, force dried in four or five hours at 150°, or air dried in twelve hours. Whatever the method, however, it does not become hard dry, but retains a slight "tack" which increases the adhesion of subsequent coats. If desired clear bond coater may be mixed equal parts with white oil primer.

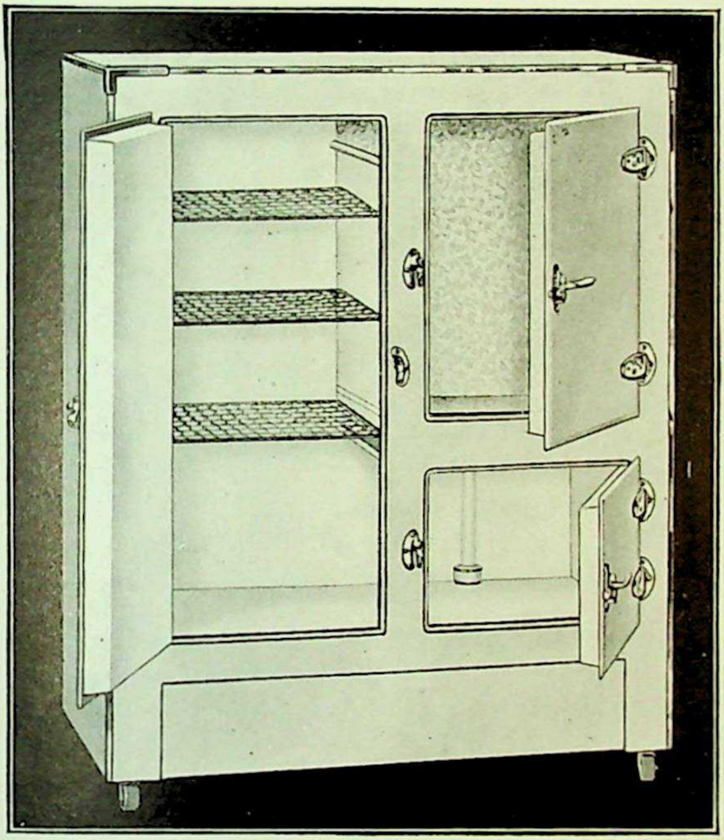


Plate IX.—Refrigerator Finished Inside and Out with Lacquer Enamel.

*Glazing.*—For an extra smooth finish under lacquer any abrasions may be knifed over with paste lacquer glaze which will air dry in about five or six hours for sanding. For a paint-enamel finish use a white lead putty.

### OIL ENAMEL

*Second Coat.*—This consists of regular white oil enamel undercoater to be applied directly over the bond coat or primer. A typical white surfacer may be reduced about three parts to one of naphtha for spraying, four to one of turpentine for brushing, and air dried in eighteen hours or baked at about 150° F. for four to six hours according to the manufacturer's directions. Only light sanding is required with 6/0 dry paper, and two coats will give extra smoothness.

*Third Coat.*—This may be gloss or eggshell white enamel, brushed on as received, or reduced five parts to one of naphtha for spraying. Most brands will air dry in from thirty-six to forty-eight hours and bake at 150° F. for six to eight hours.

### LACQUER ENAMEL

*Second Coat.*—This may be the same as that for oil enamel, but often is the same lacquer enamel described in the next step. If the latter it may be applied directly over the bond coat without danger of "picking up," providing both materials are properly constructed for the purpose by a reliable manufacturer and the bond coat is dried as previously specified.

*Third Coat.*—This should be a special gloss-white lacquer enamel characterized by elasticity, free flowing and freedom from the lacquer odor which ordinarily affects butter and milk. It should be reduced with special reducer, one part to two of the enamel, sprayed on in the regular way and allowed to dry five hours before another coat is applied. While a slight odor will be perceptible for twenty-four hours, if the doors are left open, this will disappear. If desired for rush work, force drying will remove the odor in six to seven hours at 110° F. Two coats of lacquer enamel over baked oil primer, or three at five hour intervals over the bond coat, give an excellent, durable finish.

### METAL EXTERIORS

The finish is the same as for interiors, using baking primers or bond coat and oil or lacquer enamel, the latter two gloss or eggshell white or light gray.

### WOOD EXTERIORS

*Varnish.*—For transparent finishes oak, ash and elm are the preferred construction woods. All are open-pored so that if a natural effect is satisfactory, stain may be omitted and wood filler of light shade applied direct, reduced to cream consistency, brushed on with the grain and as soon as flatted, wiped off across the grain. In twenty-four hours this may be coated with clear varnish first coater and given twenty-four hours before sanding.

Over this one or two coats of waterproof coach varnish may be brushed or sprayed, and allowed to dry twenty-four hours before re-coating or packing. Or two coats rubbing varnish may be applied over the shellac for a high grade finish, the first allowed twenty-four hours before re-coating and the second thirty-six to forty-eight hours before rubbing with pumice stone and oil. It goes without saying that these varnishes are not ordinary ones, but are specially blended to produce maximum elasticity, toughness, water and weatherproofness. If desired a salt and pepper finish may be applied, using gray lacquer or water stain, white filler, lacquer and wax, as described for *Breakfast Room Furniture* (see Chapter VIII).

*Lacquer.*—First dip, brush, spray or wipe a thin oil-varnish waterproofing compound, full body, on all wood parts, air-dry overnight, follow with paste wood filler and three coats special waterproof lacquer sprayed full body at two-hour intervals. For a rubbed effect, flat lacquer may be used for the third coat.

*Enamel.*—Either the oil or lacquer enamel system for interiors may be employed, including the waterproofing compound and bond coat, but using only force or air drying, not baking, schedules. The bond coat is applied directly over the filler in the case of ash, oak or elm, directly on the wood in the case of birch or maple. Owing to the higher porosity of wood, an extra coat of enamel undercoater is desirable for oil as well as lacquer enamel. The finish color may be white or a light gray. Gum and birch call for waterproofing compound, two coats white-paint surfacer, air-dried overnight and sanded smooth, and two coats white lacquer enamel, one hour between coats.

*Backs.*—For the backs of wooden refrigerators a sealer coat of any good ready-mixed paint will serve, a black or red oxide shade being usually preferred to cut the cost.

### NOTES ON REFRIGERATOR FINISHING

All coats should be given plenty of time to dry under natural conditions, but artificial heat up to 100-110° F. with proper humidity control, will hasten the schedule without danger.

A long-oil varnish is preferable to a varnish artificially made to dry quickly; the latter is liable to be brittle and will not anchor as well. Wherever encountered end grain should be sealed with white lead putty, knifed well in and smoothed off. Parts recessed for hinges should be varnished as well as the edges of glass to help the putty stick. See that every place that moisture might enter wood or metal is perfectly sealed.

### KITCHEN CABINETS

*Metal.*—The same system as for refrigerator metal exteriors.

*Wood, Enamel.*—The service conditions being less severe than with refrigerators, one or two coats each of flat paint undercoater and gloss or eggshell enamel will serve, air or force dried, in white or light colors with conventional stencil decorations on panels.

*Wood, Stain.*—In line with the tendency to increase the decorativeness of kitchen furnishings, oak cabinets are being turned out finished in gray or brown lacquer or stain effects, as described under *Breakfast Room Furniture* in this book, and *Flat Frosting,* as described in Book III, Chapter XIII. Additional decoration may consist of vein lining or two-toning. Cheaper cabinets may be finished with combination wood filler, varnish pigment firstcoater and flat varnish, one coat each.

# CHAPTER VI

## WICKER FURNITURE

WICKER is the general term applied to furniture which is of the woven rather than solid or veneered smooth type. The strands used in the cheaper grades are "fibre" reed, which means coarse, tough paper twisted spirally to great toughness; the more expensive grades are of natural willow, reed or rattan, treated by steam to soften them for plaiting and braiding. While the finish effect is the same for both, the difference in character of the two grades is such that distinct treatments are necessary for each, alike for stain and enamel.

### STAINING FIBRE REED

Owing to the porosity of even the toughest paper it is necessary to apply a stiff preliminary coating which will cause it to hold out the finish. For a natural finish the paper twistings (fibre) are dipped in thin water glue; or the paper strips may first be dyed in aniline water stains, twisted, glue-sized and interwoven on the frame in a two-, three- or four-color pattern. All work is done by machinery up to the finish coats.

If already shaped and assembled uncoated, the stain may be brushed, sprayed or dipped, after which the piece is dipped in the glue size and dried for 24 hours. For a brown mahogany effect, a solution of about five ounces Adam brown aniline dry powder to the gallon of hot water is used; for a light brown, one to three ounces of standard brown aniline; for light gray, one ounce jet nigrosine. The number and shade of possible stain effects is limited only by the proportions of red, brown, black, green, blue and yellow aniline powders used to the gallon of water. Oil stain may also be used, but it does not dry as satisfactorily nor is it as clear in tone as the water, nor permanent in color.

The piece is now ready for a dip, spray or brush coat of tough, pale, elastic waterproof coach varnish to dry dust free in three or four hours and hard overnight. Any frosting or two-toning (See Book III, Chapter VI) may be done at this point or over the second coat of varnish—two coats are always advisable.

### STAINING WILLOW REED

The process is the same as for fibre except that no glue size is required and staining starts after the piece is assembled, a little alcohol being added to the water stain to aid penetration.

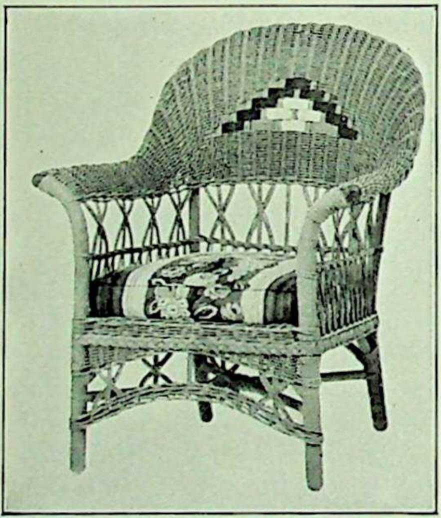


Plate X.—Willow Chair in Four-Color Pattern Effect.

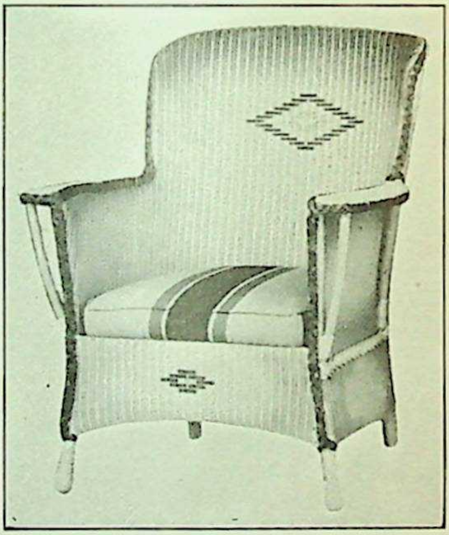


Plate XI.—Fibre Reed Chair, Showing Banding, Shading and Pattern Decoration.

Rattan is even less porous than willow and is therefore not often stained, usually being left natural or finished with a thin coat of pale varnish. It is customary first to singe off the "whiskers" with a mild flame before finishing.

### OIL ENAMEL ON FIBRE AND WILLOW

Fibre may first be glue-sized as previously described, then worked into shape, but willow is steamed and shaped without sizing. The first step is to spray on a coat of flat paint undercoater tinted to the finish color and thinned with a little turpentine to aid penetration. A brush may be used instead of a spray, but this method is not nearly as quick or thorough.

It is not, of course, possible to sand the undercoater, for which reason a very finely ground type is required which will lie smooth. Fibre calls for two coats; willow being less porous, needs but one, after which a finishing coat of elastic high grade gloss enamel is sprayed on. Some manufacturers use but one coat of primer and one of enamel, others two coats of enamel and one of primer, still others two coats of enamel only, the first reduced somewhat with turpentine. These variations depend largely on the selling price, on the character of materials and the amount of time it is desired to put into the finishing operations.

### SPECIAL OIL ENAMEL FOR FROSTING

Where the enamel is to be frosted, and practically all wicker furniture at this time is, the above methods are apt to require considerable time, since it is essential that all coats, especially the last one, be hard dry lest the frosting color penetrate and blur instead of wiping off clean and smooth. To overcome this, special "two-toning" enamels have been constructed to top dry with extra speed but without sacrifice of elasticity. Such enamels may be safely frosted in from five to eight hours and will give fully as durable service as the standard type.

### LACQUER ENAMEL ON FIBRE AND WILLOW

The advent of nitro-cellulose lacquers has made it possible to finish up wicker furniture complete for frosting in from twenty-four to thirty-six hours. A special elastic lacquer primer should be employed, followed by one or two coats of lacquer enamel, but many think it better and cheaper in the case of glue-sized fibre to employ a paint undercoater of a type adapted to use under lacquer, allowing it to dry twenty-four hours, followed by a coat either of colored or clear lacquer. Naturally oil or oil and japan frosting colors may be applied to lacquer enamel with safety in an hour or less, and lacquer enamel may be applied to willow with either clear lacquer primer or no primer at all. Spraying is preferable to dipping or brushing.

### BRONZE FINISHES

A bronze finish on wicker furniture may be produced in two ways. If the bronzing liquid be varnish, it is best to seal it with a coat of shellac substitute before frosting. The speedier method is to use a lacquer bronzing liquid for the metallic powders, as no intermediate shellac coat is necessary before applying the frosting color which may also be applied much sooner. Bronze finishes on wicker furniture are often antique glazed, which should have a protecting clear coat.

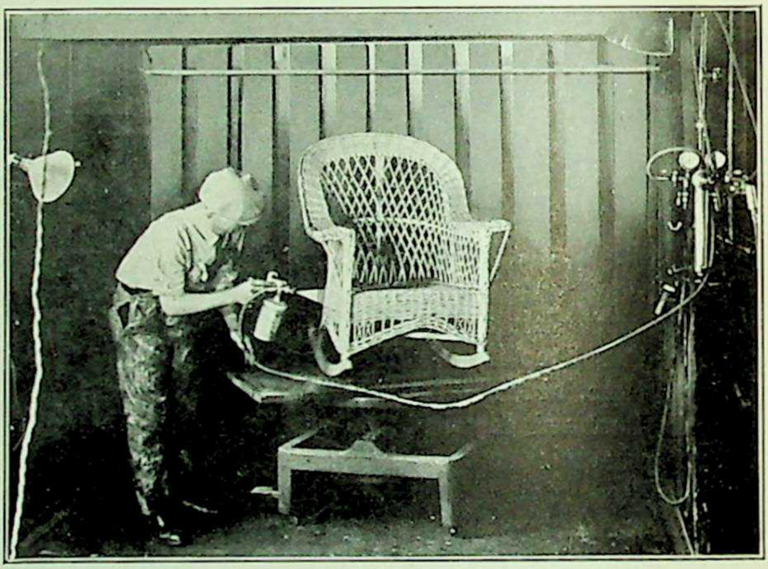


Plate XII.—Spraying a Willow Chair with Tinted Paint Undercoater.

### PATTERN TWO-TONING AND SHADING

As a variation from frosting wicker furniture, it is often banded or two-toned, by applying an enamel color of harmonious or contrasting shade to the plaited band running along the front of a chair seat, or over the arms and back, around the top of a table, the feet or legs, or even on a design woven in the back or front of a chair or settee or in a table top. This latter must be done with care by means of a pencil brush, but of course is not necessary if the fibre has been colored previous to weaving in the pattern. For color combination, appropriate alike for this and for two-toning by frosting, see Book III, Chapter VI. Shading and color glazing by spraying are extremely handsome as an additional decorative feature.

## CHAPTER VII

## RADIO CABINETS

THE finishing of radio cabinets depends in the main on three factors, the wood, speed of production and grade. High class radio cabinets are made of veneered mahogany or walnut and are finished exactly like furniture of the same quality; cheaper cabinets are made entirely of gum or poplar or veneered on fronts and tops with walnut or mahogany. Moreover the cheaper cabinets are turned out on a quantity basis, usually on

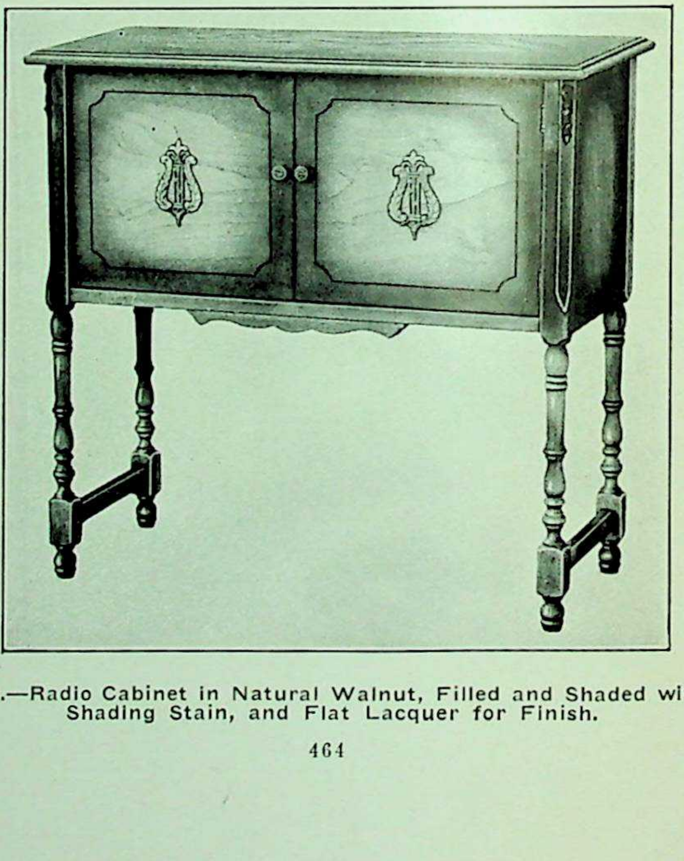


**Plate XIII.—Radio Cabinet in Natural Walnut, Filled and Shaded with Spirit Shading Stain, and Flat Lacquer for Finish.**

a contract that calls for the utmost in speed and low cost of finishing. For simplicity we shall refer to these latter as Grade B and the former as Grade A work.

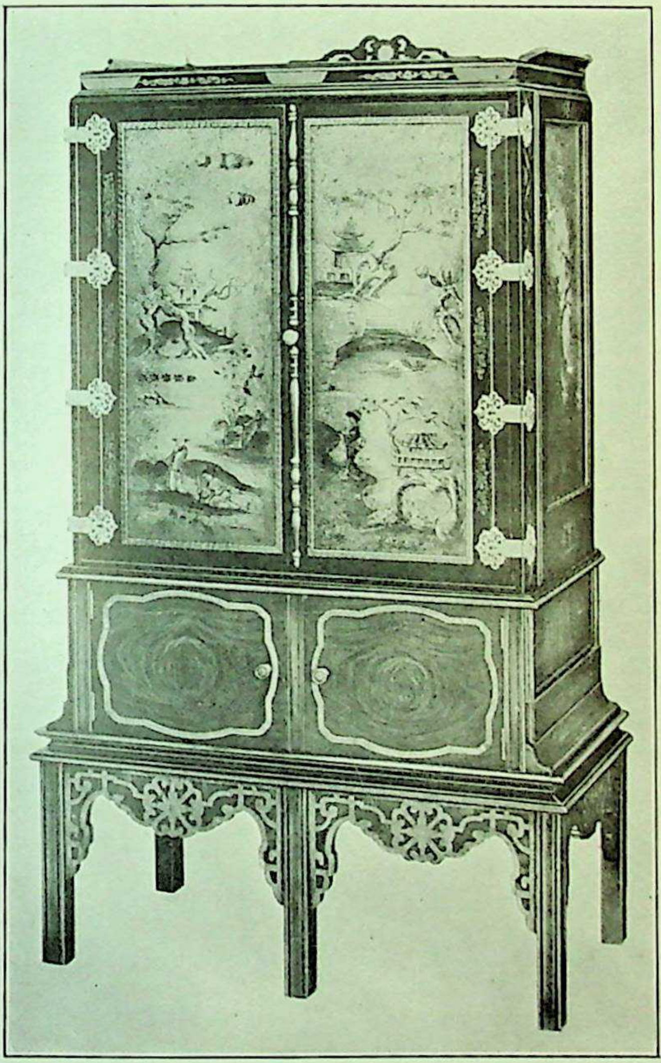


**Plate XIV.—Radio Cabinet Combining Decorative Processes of Oriental Lacquering, Fret Work, Matched Veneers, Shading, Carving, Hand Painting and Bronzing.**

### GRADE A

On Grade A work a water stain of desired shade is used, followed by a wash coat of shellac, paste wood filler, then a coat of shellac and two coats of varnish or two coats of clear body lacquer, or the last coat of flat varnish, or flat lacquer to save

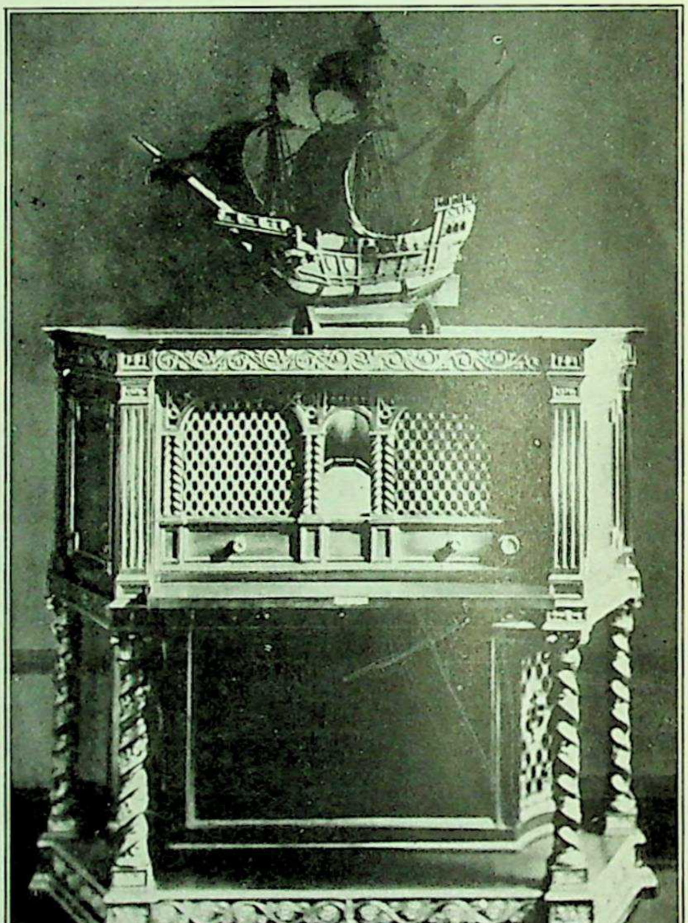


Plate XV.—Spanish Renaissance Style Radio Cabinet of Walnut Elaborately Carved.

rubbing. Any decorating may be done on the sanding varnish or lacquer coat, or if but one coat of varnish is applied, on the shellac coat. Where framework is of gum or birch it is not necessary to fill. (See Book III, *Matched Veneers, Shading and High-lighting, Two-Toning.*)

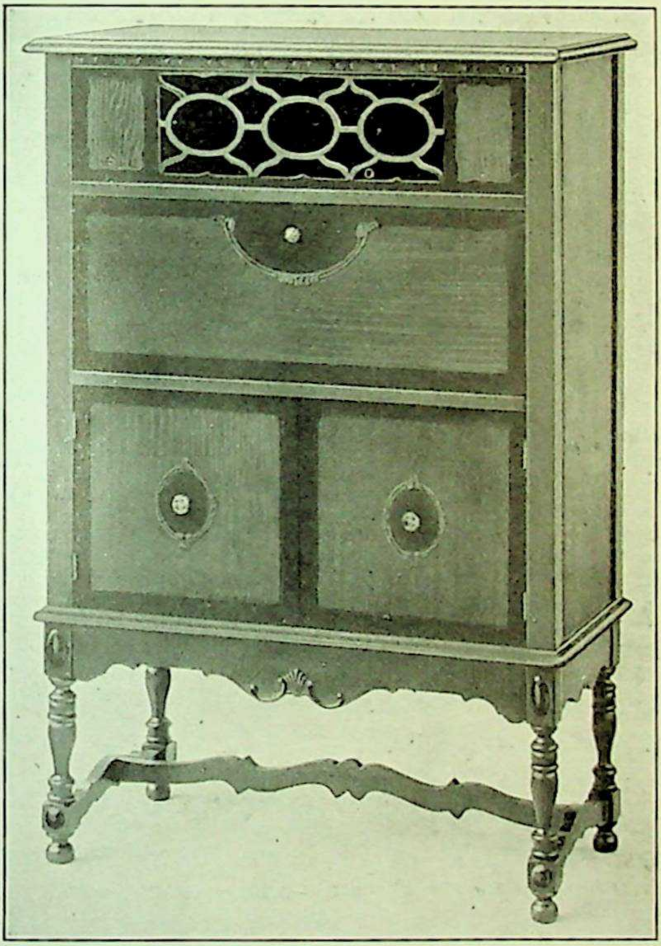


Plate XVI.—Radio Cabinet in Two-Tone Walnut Finish, Showing Grille at Top.

### GRADE B

On Grade B work it is manifestly undesirable to use a water stain in view of the sanding expense thus incurred. Spirit stains also present this difficulty and are in addition fugitive to light. Thus only oil stains remain, but while safe enough under varnish, cannot at least in the mahogany shades be considered entirely stable under lacquer, due to the bleeding action of the lacquer solvents on the red aniline component of the stain. Nevertheless, while few stain manufacturers are willing to guarantee such oil stains against action nor to "take" uniformly on soft woods, the following typical schedules are representative of those widely used in production where necessity for speed and economy is the cardinal principle. If not lacquered, brown mahogany oil stain should be preferred on gum, poplar and cottonwood to walnut oil stain, for while both turn dark on sap and soft streaks, the effect in the mahogany finish is less unsightly because it is naturally dark in tone. Lacquer over most walnut oil stains causes no trouble.

### COMBINATION WALNUT OR MAHOGANY

*System 1.*—Spray, dip or brush walnut or mahogany oil stain of a pronounced brown shade directly on the wood, wiping off even with rags if dipped; spray 2 lb.-cut shellac coat on gum, birch or poplar, a wash coat on walnut or mahogany veneer, and sand; fill the latter with paste wood filler; surface and let dry twenty-four hours; apply 2 lb.-cut shellac coat to filled portion and sand; spray on one coat clear body lacquer; spray on second coat of same and rub dull.

### GUM, BIRCH OR POPLAR

*System 2.*—Spray, dip or brush on one coat of combination filler-stain of walnut or mahogany shade, purchased from a reliable manufacturer for use under lacquer; smooth off with excelsior when dry and spray on a coat of 2 lb.-cut shellac; sand when dry and spray on one or two coats of clear body lacquer, rubbing the last dull.

*System 3.*—Spray on the desired shade of walnut or brown mahogany oil stain; let dry hard and spray on a wash coat of pure shellac; let dry and spray on a coat of special clear lacquer first coater containing sufficient transparent pigment to fill the small pores but not enough to cloud the finish. (This is now obtainable ready for use and may be slightly tinted with spirit anilines dissolved in lacquer thinner to improve the uniformity of stain color tone.) Finish with one or two coats of clear body lacquer, the last rubbed dull.

*System 4.*—The same as any of the foregoing, except that flat lacquer or varnish of desired sheen is employed for the final coat in order to save the expense of the rubbing operation.

*System 5.*—Spray or brush on water stain of desired shade, sanding smooth when dry; follow with three coats of good grade waterproof shellac substitute, giving the final one a light rub. The inexpensive character of the shellac substitute and the light rub on the last coat offsets the cost of sanding down the water stain, but the finish cannot be considered as either elastic or durable.

Poplar and gumwood, owing to their porous, spongy character, will require an extra coat of shellac, varnish or lacquer, according to the system.

## SHADING AND DECORATING

In all of the above the shading, two-toning and decorating operations may be included, as described in Book III. Where the upper part of the cabinet is painted, oriental lacquer effects are popular.

## CHAPTER VIII

### BREAKFAST ROOM FURNITURE

THE increasing trend toward narrower dimensions in American homes, alike in city and suburbs, combined with the realization that economy in space is most readily effected in the dining room, has brought forth a new type of furniture—the breakfast room style. Miniatured in proportions, the best examples express in design and finish daintiness, dignity and durability.

The brighter painted styles are most popular for the country home—in the city the more subdued shades or the more sombre tones of stain are preferred. The variety of treatment in point of finish is so great that it will be best to cite the most common methods, the wood as always, playing an important part.

### STAIN—WALNUT AND MAHOGANY

1.—A coat of water stain, high-lighted and shaded if desired, a wash coat of shellac, paste wood filler, shellac and two coats of varnish or clear body lacquer, rubbed dull. The wash coat and filler may be omitted if an antique open-pored effect is preferred.

2.—A coat of water stain, shellac wash coat, wood filler, shellac substitute, a coat of clear body lacquer, spirit shading stain, a coat of flat lacquer. This is quicker and cheaper but not so durable as No. 1.

3.—A coat of oil stain, shellac wash coat, wood filler, two coats shellac substitute or 2 lb.-cut shellac, spirit shading stain for high-lighted effect, one coat flat varnish. Rubbing varnish is preferable on table tops.

### STAIN—BIRCH, GUM AND POPLAR

4.—Same as 1, 2 or 3, omitting shellac wash coat and wood filler.

### STAIN—OAK

5.—Water stain, any shade of gray or brown, wash coat white shellac, white pigment wood filler, white shellac or pale lacquer, wax. It is impracticable to use varnish over gray stain as it may turn the color in the lighter shades an unsightly green as, for instance, with silver gray oak. Lacquer enamel may be used in place of stain, reduced one part to four of reducer.

6. Brown water or oil stain, a coat of shellac, one or more coats of lacquer, varnish or wax. This is practically a mission finish, and being open pored, gives a somewhat antique effect, especially if the stain is on a gray tone. If desired the stain may be shellac wash-coated and the work filled with brown wood filler for a smooth finish.

### DECORATING STAINED WORK

A stained finish may be enlivened by high-lighting, two-toning with paint or a darker shade of stain, hand-painting, vein lining, transfers, imitation marquetry or striping, all on the "building up" coat, just prior to the final clear, protective coat. Oak in addition may be frosted, banded and stenciled.

### PAINT—BASSWOOD, BIRCH, GUM AND POPLAR

Undercoaters should be carefully adapted to the nature of the wood. Thus, where soft woods like gum, basswood, magnolia and poplar are employed, the primer should be given an extra proportion of boiled oil to satisfy suction, but if the wood is hard like birch or maple, the addition of a little turpentine will increase penetration and insure a firmer anchorage.

Unless the wood is sanded to perfect smoothness and patched where necessary with white lead putty, a flawlessly smooth finish is impossible. Moreover the better the grade of undercoater, *i. e.*, the more finely it is ground, the less necessity there will be for sanding and hence danger of cutting through nibs.

Plate XVII.—Breakfast Room Set of Green Enamel Banded in Black with Imitation California Redwood Burl Block Graining over Poplar on Table Center and Chair Back Overlays.

### OIL ENAMEL

7.—Two coats undercoater, tinted to desired shade, followed by one coat eggshell enamel left natural or one coat gloss enamel, rubbed dull. Decorate over top coat with japan color mixed in a little rubbing varnish to bring up lustre. On coarser grained lumber an extra coat of enamel is often advisable.

### PAINT UNDERCOATER AND VARNISH

8.—Three coats undercoater, tinted to desired shade, decorate and protect with one coat rubbing varnish rubbed dull or one coat flat varnish. The varnish will turn the lighter shades of undercoat color somewhat and this should be allowed for in selecting the shade. If desired the third primer coat may be eliminated in favor of a coat of white shellac as a base for decorations, or a shellac coat may be applied just prior to the varnish. Flat varnish is not so desirable on table tops as rubbing varnish.

### PAINT UNDERCOATER AND CLEAR LACQUER

9.—Same as above except that body lacquer or flat lacquer is substituted for rubbing varnish and flat varnish. This is speedier, but the materials used in decorating as well as the undercoater itself must be of a nature rendering them adaptable for use under lacquer without softening.

### JAPAN COLOR AND CLEAR LACQUER

10.—For a very speedy finish apply one coat japan color, decorate and finish with one coat shellac and body lacquer, rubbed dull, or one coat body lacquer and flat lacquer. The wood must be extremely smooth for a job of this nature.

### LACQUER ENAMEL—BASSWOOD, BIRCH, GUM AND POPLAR

11.—One coat clear pigment lacquer first coater, tinted one quart of the lacquer enamel to the gallon, sanded and followed in four hours by lacquer enamel of desired shade. An extra coat of lacquer enamel may be applied for greater body, but in either case the top coat may be rubbed dull, polished or given a clear coat of flat lacquer over decorations to save rubbing or a clear coat of gloss body lacquer, rubbed dull or polished, for extra durability and resistance to wear.

### TRANSPARENT LACQUER ENAMEL FINISH

12.—One coat lacquer enamel of desired shade, mixed one part to twelve or fifteen of clear lacquer pigment first coater or clear gloss or flat lacquer, the former preferably on porous woods. Sand smooth in five hours, decorate and apply a second coat of clear lacquer, flat or gloss, to be rubbed dull. Walnut and mahogany stain effects may be procured by selecting nut brown and reddish brown shades, novelty color effects with bright greens and reds, the wood grain showing through in all cases. By regulating the spray mixture antique and color shading may be introduced into the first coat or antique lacquer shading stain may be used over the reduced lacquer enamel as a separate operation.

## DECORATING PAINTED OR LACQUERED WORK

Colored finishes on breakfast room furniture may be enriched by antique or color glazing, stipple glazing, two-toning, banding, striping, crackling, spattering, stencils, transfers, free-hand painting, bronzing or oriental lacquering.

# CHAPTER IX

## GRAINED METAL FURNITURE

OWING to the necessity for furniture of extra durability, particularly in hotels, offices and clubs, the art of imitating a wood grain finish on metal has advanced considerably in late years and now offers a choice between the old brush-and-rag method and the new block method. The former requires the services of a skilled hand grainer, the latter can be accomplished by anyone capable of operating a machine or handling a simple tool. The difference lies chiefly in the graining—the primer, ground color and finishing operations are the same.

### CLEANING AND SURFACING

The first step is to clean the metal for which there are a number of excellent patent compounds on the market, most of them intended to be mixed and applied hot. The simplest method is to wash with benzine or naphtha, sand the metal while wet in order to remove any roughness or incipient rust, using 2/0 flint or 5/0 garnet finishing, then wipe dry with clean rag. If, and only if still too rough, fill with paste iron filler of gray or neutral color. This is reduced to milk consistency with benzine or naphtha, sprayed, brushed or dipped on, and wiped smooth while part dry with a leather pad, or allowed to dry hard naturally in twenty-four hours, or force dried overnight at 110°-120° F., or oven baked at 200° F. for two or three hours (if possible allowing to cool in oven), then sanded with medium fine paper. Pieces with bad dents should be rejected or knife-filled with white lead putty, sanded smooth when dry.

### PRIMER AND GROUND COAT

Metal primer, ordinarily the first coat, is applied by spraying, brushing or dipping, reduced usually about five parts to one of naphtha for dipping, six parts to one for spraying, and as received for brushing—the important thing is complete coverage. It is then baked hard at 160°-250° F. for two to five hours, depending on color and type of heat, gas, oil, electricity or steam, and whether direct or indirect. When this has been lightly sanded and dusted, a coat of ground color is applied, reduced the same as the primer and baked on an average at 250° F. for three hours. The materials being so similar, this coat is often applied directly on the metal, omitting the primer. The color

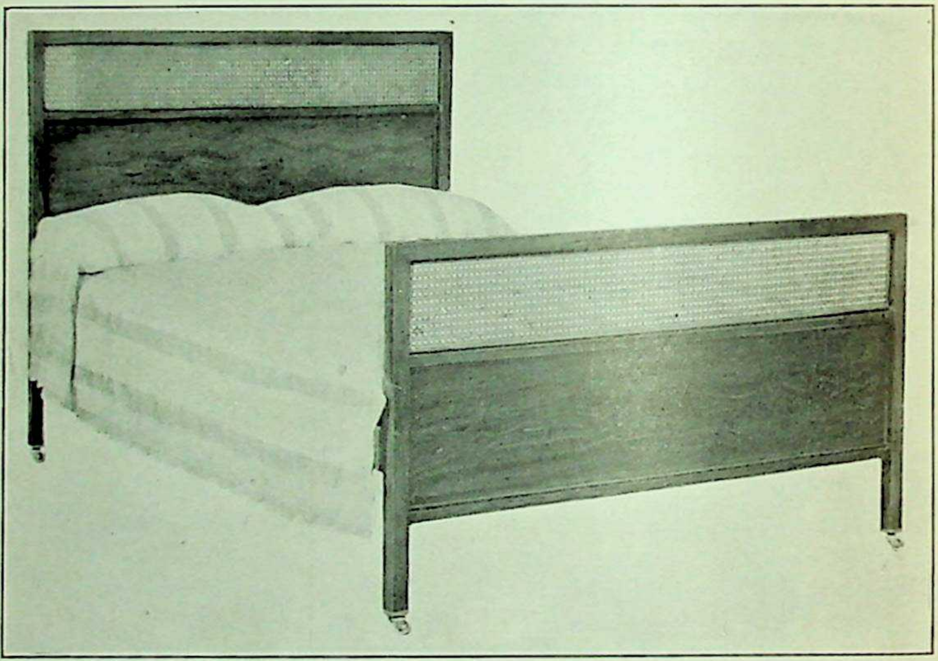


Plate XVIII.—Metal Bed with One Coat Primer-Ground Coat, Hand Graining, One Coat Flat Baking Varnish; Metal Cane Work Finished two Coats Ivory Baking Enamel, Spray Smoked with Japan Color.

is carefully chosen to provide the proper background for the wood being imitated, mahogany, walnut or oak.

## BRUSH GRAINING

The work is now ready to be grained, if by brush using japan colors for small work, oil colors for larger work, or preferably, specially prepared graining color, or ink as it is sometimes known. All are thinned to glaze consistency with turpentine and a small amount of boiled oil and are dried overnight or baked about an hour at 200° F. Mahogany and oak ground color are first stippled with drop black in japan or distemper to imitate the black pores; Van Dyke brown or burnt sienna for walnut. Patent rubber rollers may also be used. When this is dry the mahogany graining color is brushed on and graining is started at once, putting in the grain with a flat fitch brush, varying the pressure to show light and dark effects and blending out softly with a clean rag or a badger-hair blender. While proficiency in hand graining only comes with long practice, a start can be made by working beside a finished block of the wood to be imitated, noting the wavy lines of mahogany, the wavier lines of walnut and the V-shaped, yet wavier, lines of oak.

## FINISHING

Without sanding, the work after graining is brush- or spray-varnished with clear baking copal varnish, the latter method being preferable. For a high-grade finish two coats are applied, each baked at 175°-250° F. for two to three hours. The first coat is sometimes sanded lightly with fine paper and the latter rubbed with 3/F pumice stone and paraffine oil to produce a velvet finish, or a coat of eggshell baking finishing varnish may be used to get the same effect without rubbing. This latter will not give a finish that will remain dull as permanently, nor will it be as durable under ordinary conditions as a gloss varnish rubbed dull.

## BLOCK GRAINING

The block is produced by copper etching from a photograph of the piece of wood to be imitated, the dark portion on the work being depressed in the plate. A graining ink similar to oil color is furnished by the maker of the block. This compound is thinned to the consistency of cream and applied to the face of the block with a squeegee, like a windshield wiper, then wiped off so as to leave the material only in the etching.

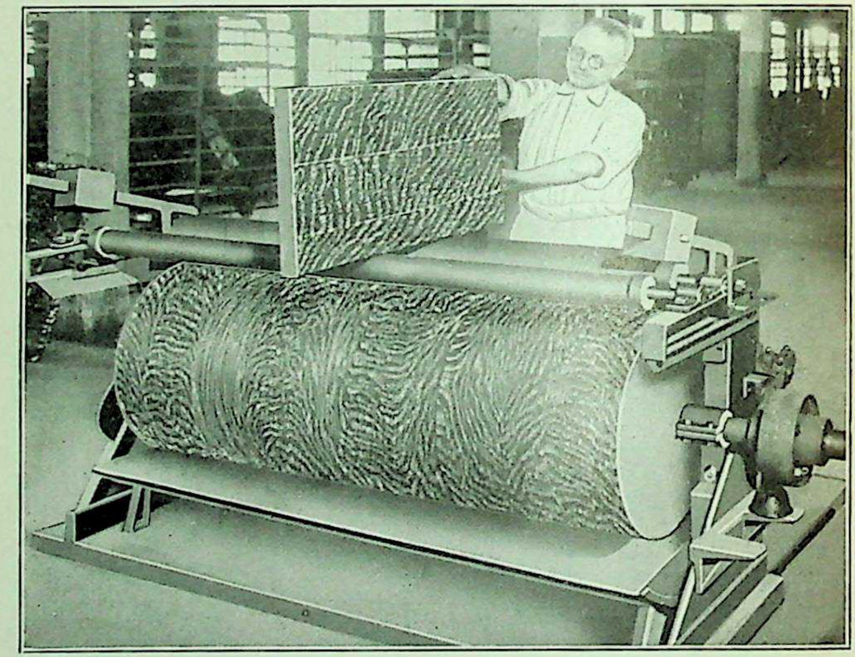


Plate XIX.—Block Graining by Machine-Operated Roller for Production Work in Oak Finish.

Next a clean soft rubber roller is run over the plate, taking up enough of the compound in the process to acquire the design.

The roller is now rolled over the ground color coat on the metal, transferring to it in one operation the complete grain impression as shown on the block. The roller is cleaned, the block recoated and the operation repeated indefinitely—by machinery if production methods make it economical. When the ink has been dried by baking or air drying, decalcomania floral decorations may be applied and the work finished as for brush graining. The block method may also be used for transferring marble effects, an operation previously done by skilled artists known as marbleizers. Where sufficient work is involved, the block method is undoubtedly the most efficient method of graining.

### AIR DRYING SCHEDULE

While the methods outlined under both brush and block for building up, graining and finishing call for baking, it is by no means impossible to secure similar results by omitting heat. This, however, would considerably slow up the schedule and would render it impractical for production work. For small jobs air drying would mean eighteen to twenty-four hours each for primer and ground color coats, overnight for graining color, and forty-eight hours for each coat of varnish. This would also involve some sacrifice of durability and adhesion.

### LACQUER GRAINING SYSTEM

For quicker work or where no baking facilities exist, lacquer materials may be used, beginning with a lacquer pigment primer and ground color and finishing with three coats of clear body lacquer. For graining japan color or distemper color are preferable, or oil colors if baked, using either the brush or block process. However, the metal should not be cleaned with benzine, but rather with one or another of the patent caustic solutions previously referred to, or lacquer reducer. Compared to a baked finish, it is a question whether the adhesion of lacquer materials can be as strong; it is certain that the filling properties and general appearance of body are not as great. For this reason the practice is generally to bake the undercoats and confine lacquer to the clear finishing.

## CHAPTER X

### ENAMELED METAL FURNITURE

TIME was when the merit of metal furniture lay chiefly in the closeness of its imitation to wood, particularly walnut, mahogany and oak. Today with the trend in all furniture lines toward color, metal furniture has followed suit with color schemes, which in harmony and finish, vie with and sometimes surpass that shown on wooden furniture. This applies not only to bedroom furniture, where white was once a stock finish, but to office furniture as well.

*First Coat.*—The preparation of the metal is identical with that already described for a grained finish and any greasy residue left by benzine is baked out in the first coat. This first coat is a baking primer which should be thin but of good hiding quality and extremely tough, best purchased from a manufacturer specializing in baking materials. It may be applied by dipping or spraying according to the construction of the piece, thinned with turpentine substitute to permit free draining but complete covering without sags. Once primed the piece should be run into the oven with as little handling as possible so as to avoid marring the fresh finish. There it should receive a uniformly distributed heat, as high as the color will stand, according to the maker's recommendations. Whites and ivories, whether primer or enamel, will rarely stand over 200° F. without discoloring, ranging up to 250° for the deepest shades, although this will vary somewhat with the different makes as well as the quality of the goods.

*Second Coat.*—With some classes of metal furniture, notably office pieces finished in olive greens which have excellent hiding properties, the original primer coat may be rubbed with pumice and rubbing oil, then pumice and furniture polish for a complete finish. On the better grades and where lighter colors are involved the primer coat is sanded with fine paper and given either (1) a second coat of the same material, to be followed by a finish coat; (2) a second coat of the same material, mixed half with gloss enamel to produce an eggshell lustre, or (3) a coat of tough high lustre enamel, after which nothing further is applied if a light shade. All are applied and baked as described for the first coat.

*Finish Coat.*—As indicated, the finish coat may be the first coat, a second or a third coat, and may be rubbed down with a felt pad and pumice stone mixed in rubbing oil or rubbed and polished with tripoli and furniture polish if a very high lustre is desired. In the lighter shades two or three coats are applied, consisting of primer for the first coat and primer and enamel mixed for the second coat, or two coats primer and one of

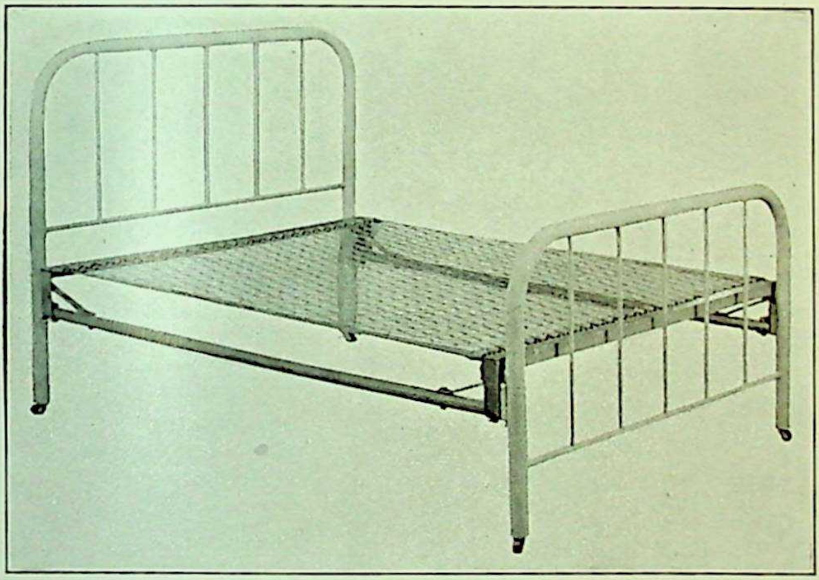


**Plate XX.—Metal Tube Bed, Finished with One Baked Coat Oxide Primer, One Baked Coat of Gray Enamel.**

enamel. If rubbed the slush is wiped off and the piece washed with water and wiped dry; with respect to polishing, the lustre as the enamel comes out of the oven or kiln is often sufficient in itself.

### CLEAR VARNISH FINISH

Where darker shades of enamel are employed the custom is to apply two coats of primer, decorating the latter as it comes from the oven, then spray or dip on a coat of clear, pale, tough varnish, which may be left in the natural gloss after baking or rubbed down as above described for an eggshell lustre.

### DECORATION

The decorating of enameled metal furniture is much the same in method as for painted wooden furniture and includes two-toning, glaze, stippling, striping, shading, free-hand painting, stencilling and banding. The work may be done either with oil colors to be baked, or with japan colors to be air dried, where a clear varnish protective coat is to be applied. Decalcomanias may safely be applied under varnish to be baked.

### TWO-COAT BROWN FINISH

For a cheap finish, especially on bedsteads, a coat of brown enamel is dipped or sprayed and baked on at about 300° F. The brown enamel should cover well in one coat and be of a shade harmonizing with walnut or brown mahogany, minus, of course, the grained effect. Over it is dipped or sprayed a coat of baking flat varnish which gives the desired rubbed lustre without the expense of actual rubbing.

### A VERNIS MARTIN FINISH

For an air dry or baked Vernis Martin finish, see Book III, Chapter XX.

## A LACQUER ENAMEL SYSTEM

The advantages of lacquer enamel for metal furniture finishing are as yet uncertain. In the first place no lacquer pigment primer has yet been developed with the same permanence of adhesion as that afforded by baked oil primer. In the second place, the application of lacquer enamel over a baked oil primer, while perfectly feasible, requires at least two coats and consequently saves little in time or expense as against the quickness of baking and the relative economy in cost of even a good grade of oil baking enamel.

Perhaps the chief talking points for lacquer enamel lie in its naturally agreeable sheen upon drying, as against the necessity for rubbing oil enamel, and the fact that greater production is possible through devoting the ovens entirely to undercoat baking. Moreover, the use of lacquer enamel eliminates all worries incident to over- or under-baking white and delicate shades of finish coat. Fundamentally the comparison is one of costs, and results along this line naturally vary with conditions as they exist in individual shops or plants.

For a lacquer enamel schedule, see *Refrigerators.*

# CHAPTER XI

## ART METAL FURNITURE

BY ART metal furniture is generally understood a class of furniture used principally for decorative purposes, chiefly wrought, malleable and cast iron and aluminum. It includes period and novelty hall and sunroom chairs, ferneries, torcheres, benches, magazine holders, ash receivers, pedestal and four-legged tables, book troughs, coffee tables and the like. They are seen largely in twisted outlines—chairs and benches are usually equipped with cushion seats and tables frequently have walnut or marble tops. The type of finish applied may be classified as natural, black, painted, bronzed or polychrome.

### NATURAL

The natural, which is also known as a Swedish finish, requires little or nothing in the way of materials. The metal is first machined to a medium bright lustre and over this is applied a thin coat of gilsonite asphaltum or black japan color, wiped off immediately while still wet so as to appear only in dents and depressions which have not been surfaced up by the machinery. This gives a mottled appearance, agreeable and apparently natural in effect.

### BLACK

As the natural color of iron to many people is black, it is often enhanced in the finish with a practical view at the same time of preserving it from rust. This may be done by dipping, spraying or brushing on gilsonite asphaltum, japan color or flat black lacquer. The lustre may be increased by adding varnish to the japan color or providing an eggshell or gloss black lacquer. Either way and regardless of material, black forms an excellent background for colorful cushions or for polychroming where the design permits.

### PAINTED

The most popular painted effect for wrought iron furniture is known as "verde." This is supposed to represent ancient bronze which has turned green from age and may be procured in two ways. The metal may be painted a verde green with

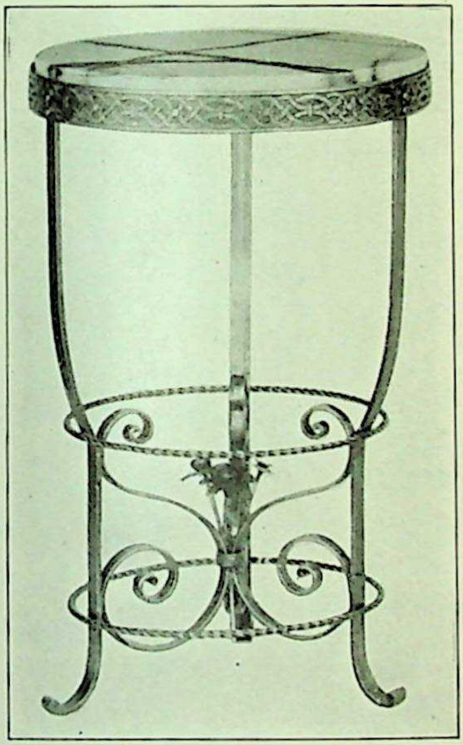


Plate XXI.—Wrought Iron Table, Marble Top, with Gold Bronze Lacquer Finish and Polychroming on Flowers.

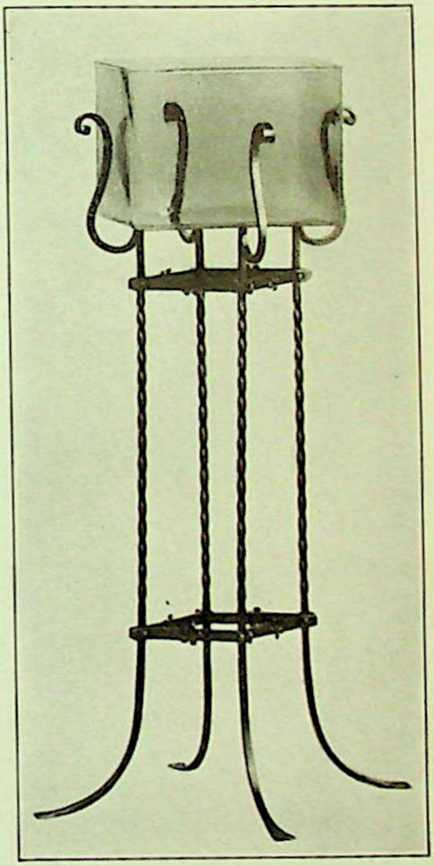


Plate XXII.—Wrought Iron Aquarium with Verde Copper Finish, High-lighted in Gold Bronze.

japan color and stippled with a glaze of equal parts burnt sienna and black, or vice versa. The verde green is mixed with equal parts medium chrome green and flake white with a drop or two of burnt sienna and drop black added to dirty the tone. The stippling or mottling may be done with a brush or with a sponge and no protective coat is ordinarily applied, unless a clear flat varnish or lacquer, in order to preserve the essential dull lustre.

Where an antique effect is not essential, any desired color of lacquer enamel or color varnish may be applied, the latter ordinarily over a primer coat of oxide, red lead or sublimed blue lead base. The finish color or colors may be high or low in lustre and be antique glazed, stipple glazed or polychromed as desired. Smoker stands are often finished in black and red or black and green.

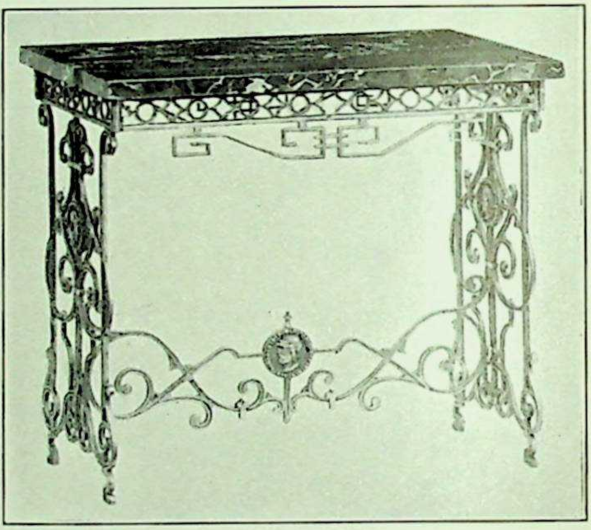


**Plate XXIII.—Bronze Coffee Table, Marble Top, with Gold Leaf Finish, Antique Glazed.**

BRONZED

Bronze powders mixed in a lacquer or varnish bronzing liquid are a popular one-coat finish, applied all over or in part. Gold leaf may also be used, but except in the very expensive grades, does not ordinarily find preference. Either the bronze powder or leaf may be burnished on high lights according to the design, but both are almost invariably antique glazed. A mixture of bronze powder with dry burnt umber in the bronzing liquid gives an excellent one-coat antique worn effect without the necessity for glazing. Hammered effects with a stipple base, as described elsewhere, are also popular for this class of work.

## POLYCHROME

Polychrome work may consist of successive coats of metallic bronzes, sprayed on, so as to overlap one another in a variegated blend effect all over, or of touching up here and there as with heraldic motifs, or fruit and leaf effects. In each case the work is done by hand based on the character of the design and is primarily an artist's job. There is no limit to the number of colors which may be employed or the extent of blending, though the design naturally sets a limit, since an entire piece finished in strong primary colors would naturally be overpowering. The colors are customarily antique glazed (except the metallics) and a clear gloss varnish or lacquer coat acts as a protection. Black is usually the background color and acts as an excellent foil, though dark brown and dull green may also be employed, either paint or lacquer.

# CHAPTER XII

## NOVELTY FURNITURE

NOVELTY furniture is a trade term comprising a class of semi-utilitarian, semi-decorative pieces of which the following are leading examples: End tables, humidors, cellarettes, Priscilla and Martha Washington sewing cabinets, book troughs, magazine carriers, book cases, hanging shelves, gate-leg, coffee, tilt-top and card tables, telephone sets (cabinet or table and chair), tabourets, consoles, corner and smaller secretary desks.

The fact that their dimensions are small makes it desirable to introduce color into the finish wherever possible, as decoratively they serve to enliven the general room scheme, standing out in relief against the more sombre tones of walnut and mahogany furniture. However, this is not always the case, since oftentimes this color note is sufficiently carried out in drapes and upholstery so that the finish color in the novelty pieces is intended rather to harmonize with, if not actually to match, the principal walnut and mahogany pieces.

### STAIN

If for the latter purpose, the wood is stained, and filled if necessary, as outlined under *Radio Cabinets*, finished and decorated in the same manner. Gum, poplar and birch are the common woods with some walnut and mahogany veneer on the better grades.

### PAINT AND LACQUER ENAMEL

Where the color note is to predominate, any of the systems mentioned under *Enameled Wood Furniture, Art Metal Furniture* and *Breakfast Room Furniture* may be employed, ac-

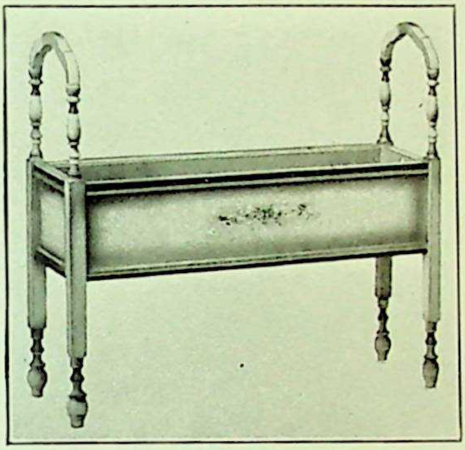


Plate XXIV.—Fernery in Light Green Lacquer Enamel, Shaded and Transfer Decorated.

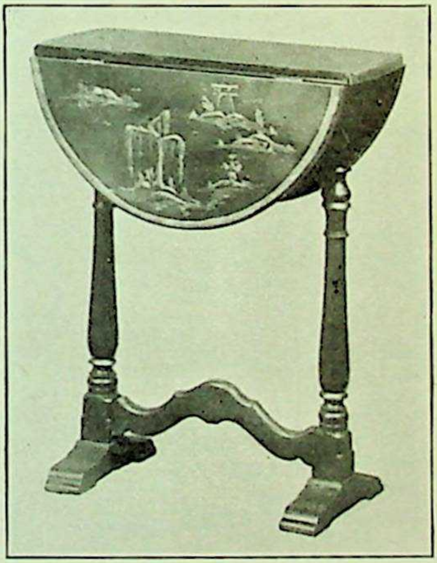


Plate XXV.—Folding End Table of Black Lacquer Enamel with Gold Raised Oriental Decoration.

cording to the wood or metal used in construction. It is noteworthy in this connection that an ever increasing amount of novelty furniture is being turned out in aluminum, steel and malleable iron. Waste baskets are frequently of sheet steel grained as described in Chapter IX.

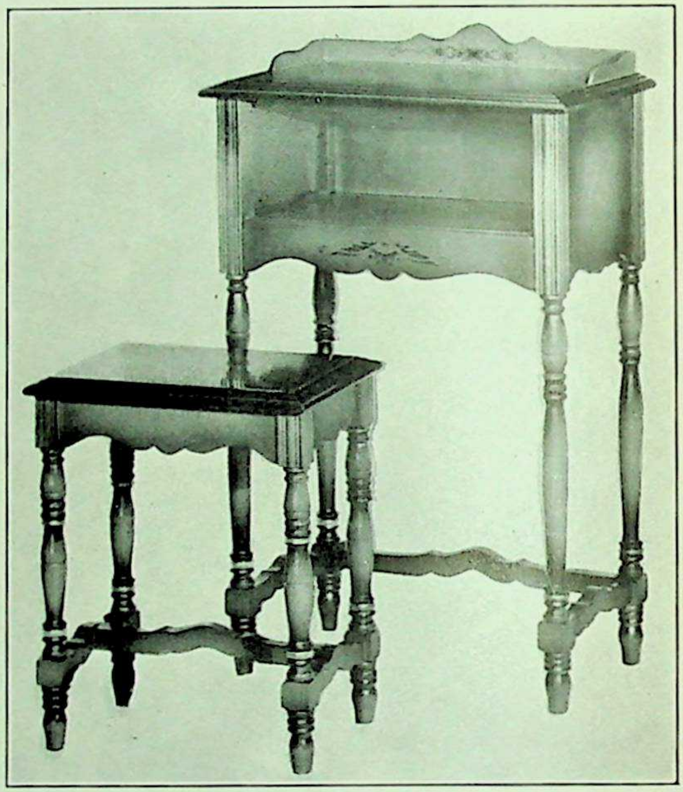


**Plate XXVI.—Telephone Set in Flat Undercoater Shaded with Lacquer Stain, Transfer Decorated and Varnished.**

## COLOR SCHEMES

The popular colors for novelty furniture include Chinese red, jade green, lettuce green, Chinese yellow, turquoise blue, amber, parchment, French gray, gray green, cardinal red, lavender, champagne and black. All of these that harmonize may be used in combination.

### DECORATION

In decoration novelty furniture runs riot; in fact, practically every method outlined in Book III may be employed according as the piece may be stained, painted or lacquer enameled. Stain and paint are frequently combined, as on secretary desks, which may be of shaded maple, banded and striped in color, the interior finished in a bright glazed color to match banding or

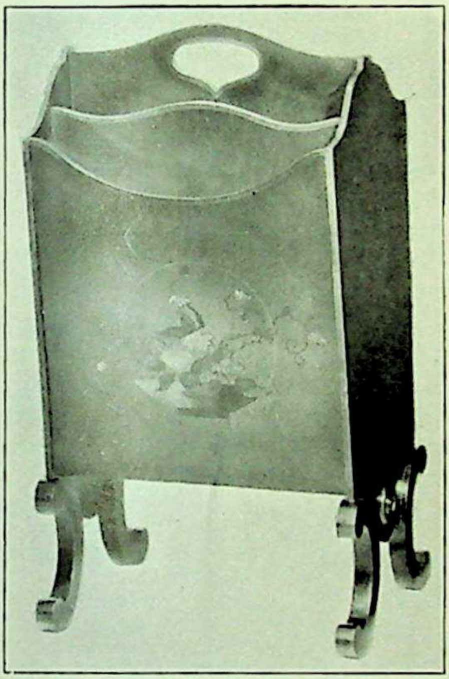


Plate XXVII.—Magazine Carrier in Lacquer Enamel, Shaded and Decorated with Transfer.

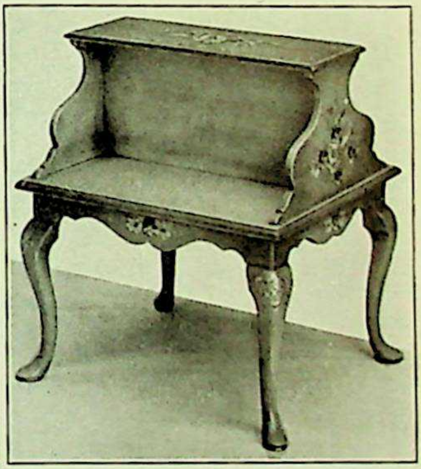


Plate XXVIII.—Magazine Rack and Book Holder, Spray Shaded and Hand Painted.

striping. The doors may be done in an oriental lacquered or hand-painted landscape scene.

Stencils and hand-painted floral and fruit groups are suitable for corner cabinets which may also be banded or striped and antique glazed. Much of the decoration of novelty furniture is coarse and crude in character; this is largely a fault of execution rather than a necessary economy in labor or materials. As a consequence delicately treated work stands out in superiority and commands a proportionately higher price at no greater cost.

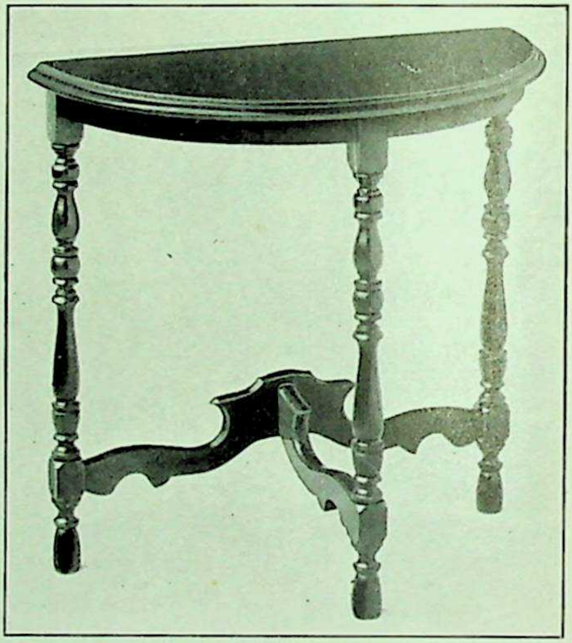


Plate XXIX.—Gum End Table in Brown Mahogany Oil Stain and Flat Varnish Finish.

# CHAPTER XIII

## UPHOLSTERED FURNITURE

FOR obvious reasons the frames of upholstered furniture are finished prior to the upholstering. The wood used for the better grades is birch, for the cheaper grades, gum; if elaborately carved, solid mahogany or walnut is employed. Practically all of the finish coats except shellac can be and often are dipped, although the brush and spray lend themselves better to special classes of work where the design is elaborate. A comparatively shallow tank will take care of all dipping requirements nicely.

### GUM

Gum frames are stained the desired shade with walnut or mahogany water stain, followed by shellac substitute, clear varnish firstcoater and flat varnish, lightly rubbed. For very cheap work oil stain may be substituted for water stain, but the gum should be of an even texture and as free as possible from sap streaks. Wax may also be substituted for flat varnish.

### BIRCH AND MAPLE.

Birch frames are spray stained and shaded with body and water stain followed by (1) two coats of shellac, sanded, and wax; (2) coach and flat varnish; (3) flat lacquer, the last two left natural or lightly rubbed; (4) an additional coat of shellac, rubbed, or (5) a coat of clear gloss brushing lacquer, left natural.

### WALNUT AND MAHOGANY

Open-pored woods may be finished the same as birch, except that a paste wood filler is employed over the stain which should also be wash coated with shellac. Very high-grade, hand-carved work is water stained and french polished by hand.

### DECORATION

Where oil stain is used the raised parts of the frame may be high-lighted by wiping while the stain is still wet, with water stain by steel wooling after it is dry. Spirit shading stain may be used to advantage by spraying over the shellac or filler coat provided the body stain color is not too dark. (See Book III, Chapter I.) On carved frames it is often the practice to antique dust in the recesses; frames of Spanish or Italian design are frequently polychromed in gold, red, blue and green.

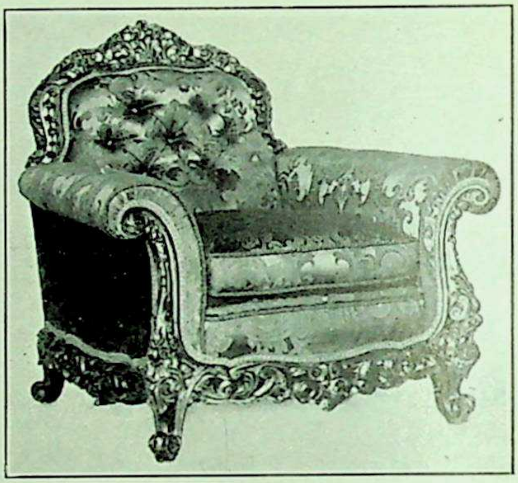


Plate XXX.—Hand-Carved Upholstered Chair, the Frame Water-Stained and French Polished.

### PAINTED FRAMES

Frames in solid colors may be finished by any of the methods outlined under *Enameled Wood* or *Breakfast Room Furniture;*

the primer coats may be dipped as well as sprayed or brushed. Decoration consists largely of striping and antique or color glazing.

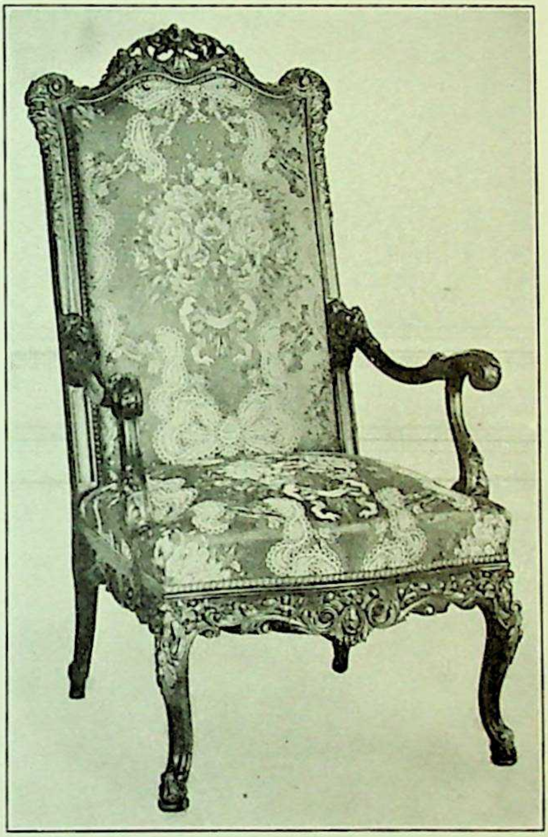


Plate XXXI.—Hand-Carved Mahogany Chair, the Frame Water-Stained and French Polished.

# CHAPTER XIV

## ENAMELED WOOD FURNITURE

APART from the special types considered elsewhere in this book, enameled furniture includes bedroom and living room suites, the finish for which will be described first, and bathroom and juvenile pieces. The choice of the method for the former depends largely on the grade and style, the woods being chiefly birch and gum, although mahogany, oak and walnut may also be used provided they are first surfaced with paste wood filler and shellac wash coated.

### PAINT AND VARNISH

On lower-priced work of gum a sealer wash coat of shellac or shellac substitute is first applied, sanded in three or four hours, puttied where necessary with white lead-varnish putty and given one coat flat paint undercoater, finely ground so as to require only a light sanding in eighteen hours. Decorations consisting of shading, stipple glazing or decalcomania transfers are then applied, followed by one coat flat varnish to avoid rubbing. For better grade popular furniture an extra coat of paint undercoater may be substituted for the shellac sealer coat and rubbing varnish substituted for flat varnish. It would also be possible to mask off and two-tone on frame, drawer fronts or overlays and add banding or striping to decorations, using a different shade of flat enamel for the former and japan color for the latter.

### PAINT AND LACQUER

On high grade work, usually birch, two coats of paint undercoater, each carefully sanded, are followed by shading, then decoration consisting of striping and hand-painting. If desired to spray stipple or shade as well, a coat of 3 lb.-cut white shellac is applied, sanded smooth, followed by two coats of pale body lacquer, both sprayed on the same day, but the second allowed to stand three days before rubbing. Flat lacquer may be used as second lacquer coat to save rubbing.

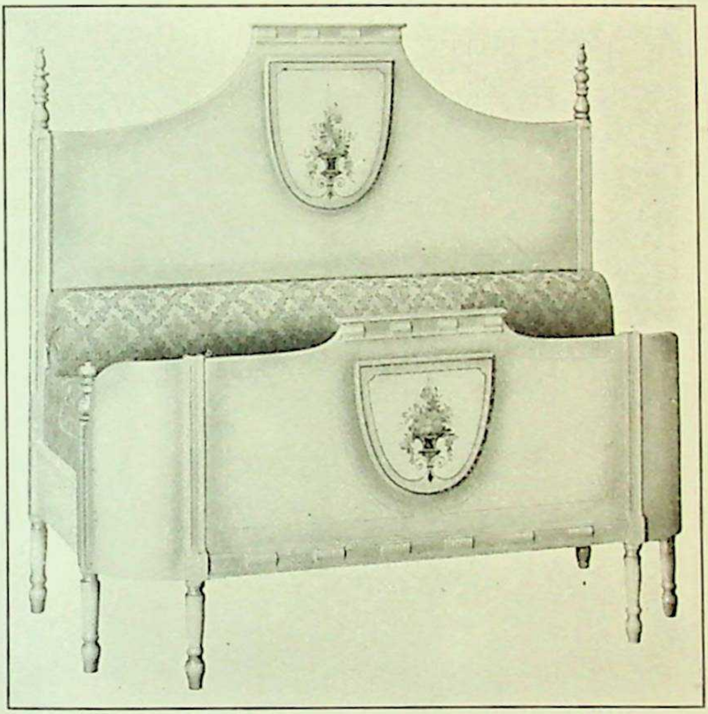


Plate XXXII.—Paint Undercoater and Rubbed Enamel Bedstead; Spray Shaded with Japan Glaze Color and Hand Painted Over Spray Stippled Overlays.

## LACQUER ENAMEL

A coat of lacquer clear first coater is first sprayed on, tinted with some of the body lacquer, followed by one or two full wet coats of lacquer enamel. Stripes, hand-painting or transfer decorations are next applied, protected with clear flat lacquer or gloss lacquer to be rubbed down. Here again it is possible to two-tone by masking off, to decorate parts of the piece with glaze stippling or crackle lacquer, banding with brushing lacquer enamel, or to omit clear lacquer coat.

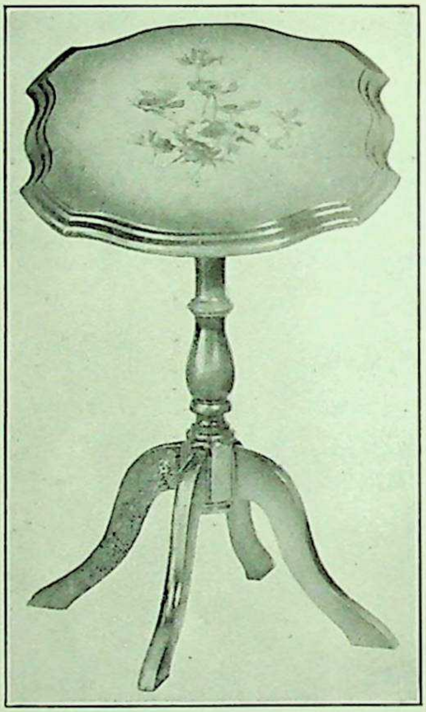


**Plate XXXIII.—Tilt-Top Table Finished with One Coat Flat Paint Undercoater, Spirit Shading Stain, Floral Transfer and One Coat Flat Varnish.**

### COLOR SCHEMES

Favorite colors for such furniture include principally the pastel shades and should be selected with care: Fawn, pale blue, pea green, lettuce green, parchment, French and putty gray, ivory, cream and mauve. In the stronger tones Chinese red, jade green and ebony black predominate. All but black may be shaded antique or in a deeper tone of the body color, but with the utmost delicacy or the work is ruined. Black is best banded, striped or lightly shaded with gold bronze. Varnish, and to a lesser extent lacquer, will affect the light colors when applied as a top coat and this should be allowed for.

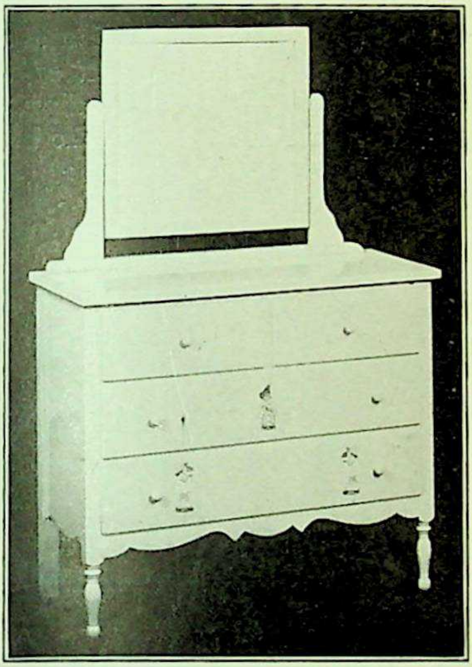


Plate XXXIV.—Juvenile Dresser, One Coat Ivory Undercoater and Gloss Enamel, Transfer Decorated.

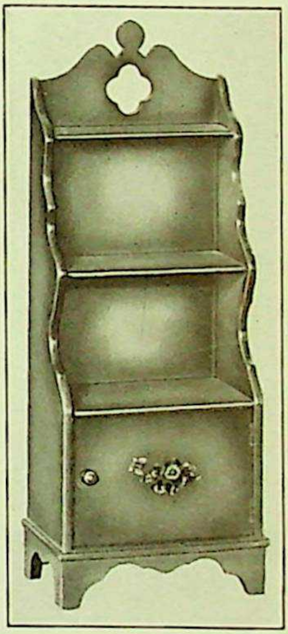


Plate XXXV.—Bookstand Showing Two Coats Lacquer Enamel and Lacquer Shading.

### JUVENILE FURNITURE

Furniture for the children include beds, bassinets, high and low chairs, desks, tables, breakfast sets, etc. Very little of this represents any attempt at real quality in finish, owing to the fact that it stands unusual abuse and is discarded with advancing age. Ordinarily one or two coats of white or tinted paint undercoater, direct on the wood or over shellac substitute wash coats, are followed by a coat of tough oil gloss enamel, left in the natural high lustre or rubbed on higher grade work. Lacquer enamel may be used over clear firstcoater where the selling price permits.

Two-toning, banding, striping, or stencils and transfers on overlays are applied to the top coat and left unprotected, but in darker shades they are put on the flat undercoater and finished over with clear gloss varnish, unrubbed. Much of this work, which is plain in design, can be finished by dipping; cane is finished natural or in the same enamel color as the body, namely, ivory, pink or pale blue.

### BATHROOM AND KITCHEN FURNITURE

Bathroom stools and hampers and kitchen stools, chairs and tables are given one or two dip coats of heavy-bodied, good hiding flat white paint undercoater with only light sanding, followed by one dip coat of high gloss white oil or lacquer enamel left in the natural lustre. Owing to the mixed nature of the woods used in construction which may be of soft or hard fibre the undercoater should be selected with great care so that it will satisfy the suction of the porous pieces. Decoration is confined to banding in a deep blue shade of enamel on kitchen furniture.

The time is in sight when greater color variety will be introduced alike into the bathroom and kitchen furniture. This is due to the fact that both rooms are being given more and more of a decorative treatment in curtains, wall colors and wallpaper patterns. Plain white does not harmonize with these, so that greens, blues and warm grays have become the vogue in order to carry out the scheme fully.

Metal bathroom or kitchen furniture is enameled as outlined under *Refrigerators and Kitchen Cabinets*, the former by dipping.

# CHAPTER XV

## SCHOOL FURNITURE

SCHOOL desks and seats are usually constructed chiefly of maple, but some oak or birch. Owing to the abuse to which they are necessarily subjected, it is impracticable to do more than give them the toughest finish possible consistent with the fact that any great expense will very likely be wasted. The wood finish which will resist juvenile carving knives, pens and metal buttons has not yet been invented.

### OAK

Oak is usually filled a light brown antique color with paste combination stain and filler. Over this a thin sealer coat of shellac is applied, followed by a coat of clear varnish first coater and a finish coat of flat varnish or print-proof coach left in the natural gloss. The shellac and varnish first coater are lightly sanded and for even production work all coats are generally applied by brushing.

### BIRCH AND MAPLE

These two woods are close grained and require no filler. They are best stained with a light gray water stain or a shade known as "school brown," a hazelnut shade readily procurable from leading stain manufacturers. Over this is applied a full coat of orange shellac followed by the finishing above mentioned. Two coats of clear body lacquer may be sprayed over the shellac where extra durability is desired.

### STANDARDS

The cast iron standards for desks and seats are finished by dipping in black, gray or brown baking japan, one coat, to bake

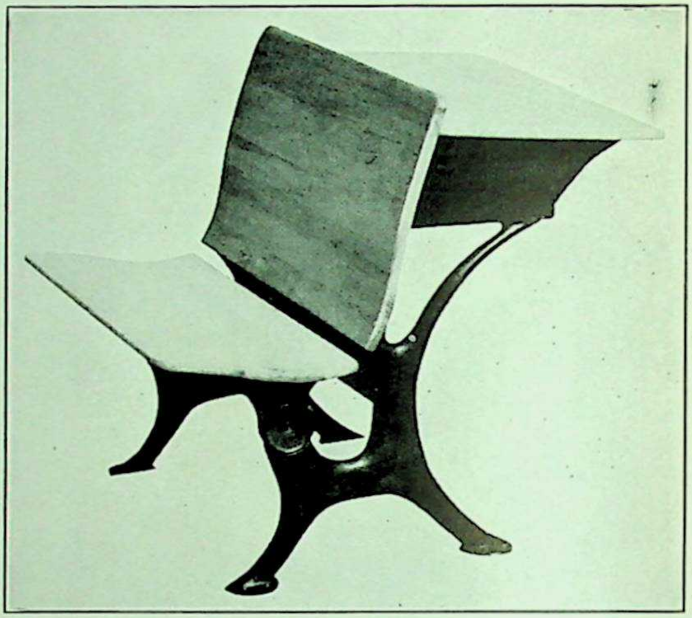


Plate XXXVI.—School Desk and Seat of Maple with Black Japan Finished Standards.

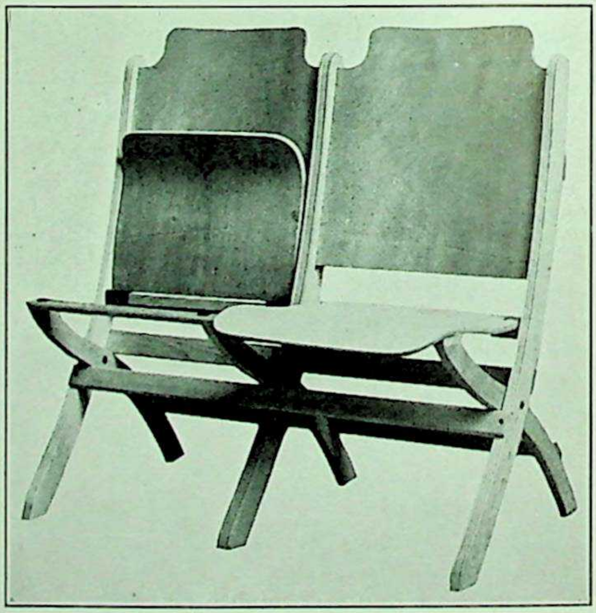


Plate XXXVII.—Assembly Room Seats of Birch Finished in Mahogany Stain and Flat Varnish

at about 275° F. for one hour. For a more decorative color finish, as on opera seats, two coats lacquer enamel direct on metal, banded or striped, or crackle finish are sprayed.

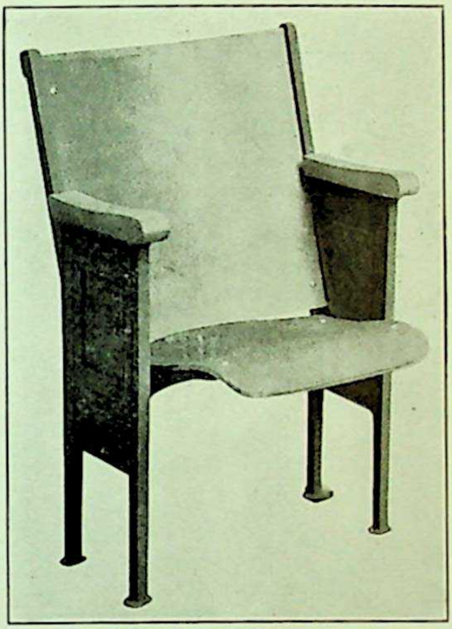


Plate XXXVIII.—Auditorium Seat of Birch Finished in Mahogany with Lacquer Enamel on the Metal Standards.

# CHAPTER XVI

## OUTDOOR FURNITURE

OUTDOOR furniture comprises principally porch chairs, settees, swings and tables, also lawn chairs, benches and swings, and camp furniture. The finish, of course, depends on the construction, wood or metal, and whether the former is to be natural or painted. Durability, it goes without saying, is the prime requisite with all.

### WOOD

*Natural.*—Where oak, birch or maple are to be given a natural finish, the procedure is to apply one or two coats of good waterproof coach varnish, similar to that used on refrigerators, but not quite so high in quality. In the case of oak, the wood is first filled on better grades with a paste wood filler of the shade known as natural, which is colorless. Birch and maple require no paste filler, but are frequently given a coat of clear varnish firstcoater. Filler, firstcoater and varnish are customarily dipped and tipped off with a brush except where the shape of the object precludes free draining, in which case they are sprayed. Backs, sides and seats of porch swings are dipped separately and then assembled when finished and dry.

*Stain.*—On some types of outdoor furniture, particularly for the porch, the wood is first stained prior to filling or firstcoating. Except forest green, which requires a water stain, oil stain is satisfactory and shows up clear in tone on the hardwoods mentioned. Antique and fumed oak are the favorite colors, applied by dipping and sealed with shellac instead of a varnish firstcoater. For a mission effect omit filler from oak and finish with flat varnish over firstcoater. The forest green water stain is ordinarily applied to maple which is so hard in texture that the grain is raised but little, requiring practically no sanding.

*Enamel.*—Outdoor porch furniture is usually painted a solid color, vermillion red or medium chrome green. The wood is birch or Oregon pine, the first coat flat paint primer tinted red or green, the finish coat high-gloss tough enamel or color varnish, specially constructed to resist water and wear. For a higher grade job one or two coats of flat paint primer are followed by striping, protected with a coat of clear waterproof coach varnish. All outdoor furniture varnishes are left in the natural gloss with little or no sanding on the first coat since an absolutely smooth job is not essential.

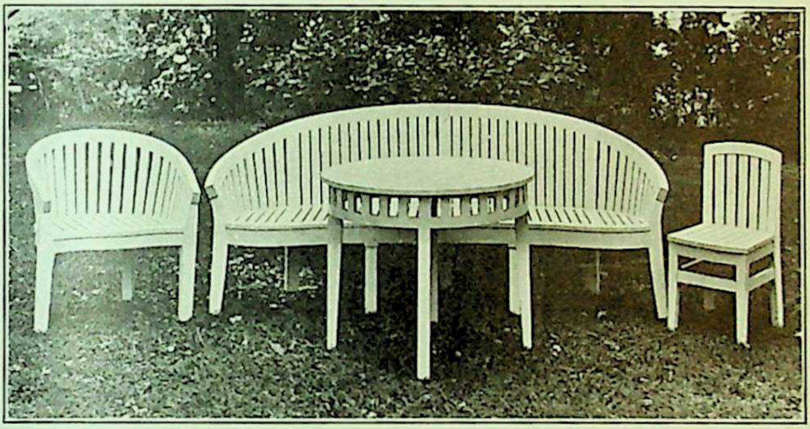


Plate XXXIX.—Garden Set of Cypress in White Long Oil Enamel.

Outdoor lawn furniture is usually built of cypress and finished in white in two grades as follows: (1) Two thin coats white lead and oil, thinned with plenty of turpentine, followed by one or two coats lead and zinc outside white house paint, the first thin, all coats brushed and without sanding between coats; (2) two thin coats finely ground paint undercoater, to the first of which is added a proportion of benzole to increase penetration, a third of the same slightly heavier, all sanded smooth, followed by one or two coats first grade long-oil gloss enamel. Both of these finishing systems are necessarily slow as paints on cypress are slow drying—thick undercoats heavy in oil often scale. Cypress, while noted for its resistance to decay, also contains an oily sap which feels waxy to the touch; to remove or neutralize this for painting, a preliminary wash with benzine is desirable, adding benzole to the first coat in addition, as above mentioned. All end wood should be sealed with paste white lead so as to prevent penetration of moisture at these vulnerable points, especially on legs.

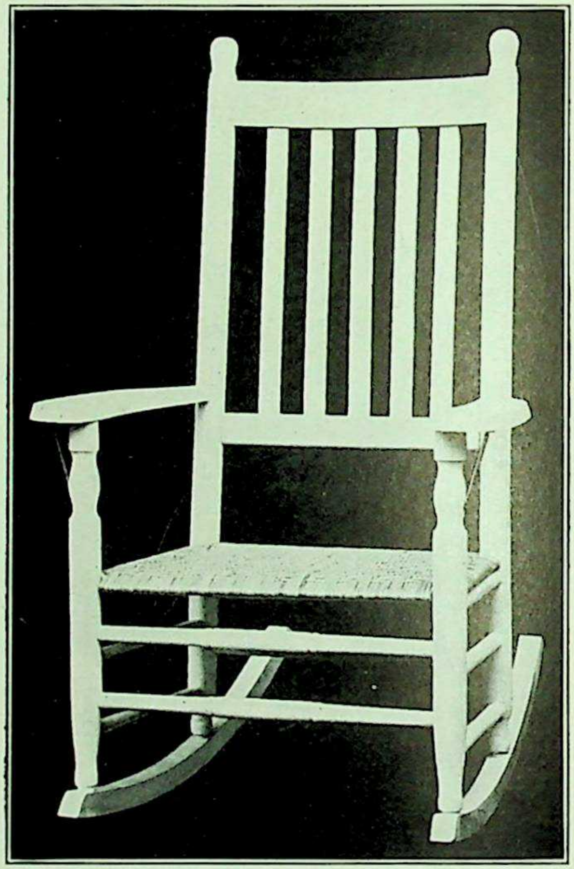


Plate XL.—Maple Rocker with Cane Seat, Finished with One Coat Each Shellac and Pale Waterproof Coach Varnish.

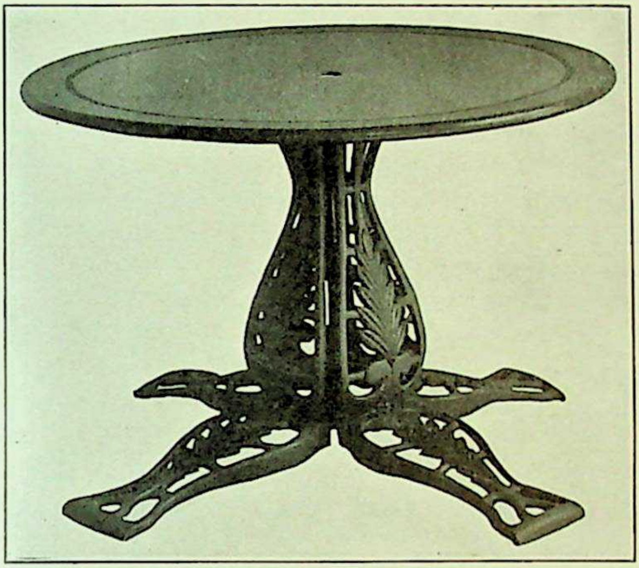


Plate XLI.—Cast Iron Table which May Be Finished in any of the Methods Outlined in the Text.

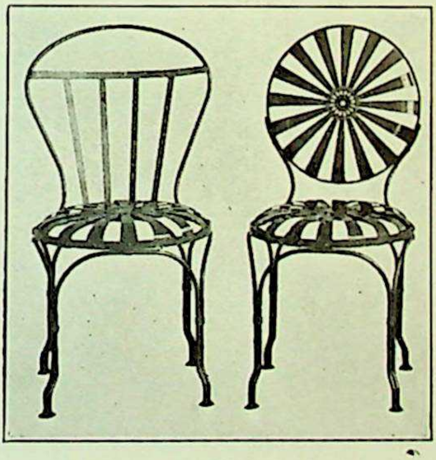


Plate XLII.—Metal Chairs Finished Two Coats Weatherproof Lacquer Enamel.

### METAL

Metal outdoor furniture comprises the stands of porch swings and lawn marquees, also lawn chairs and benches. Either two coats of automobile grade lacquer enamel in desired colors or one of these finishing methods may be followed: (1) One coat of baking metal primer (red lead, red oxide or sublimed blue lead base), reduced 3 parts to 1 of turpentine for spraying, 4 to 1 for brushing, and baked 5 hours at 200° F. or force-dried overnight at 110 to 120° F., followed by one coat gloss baking enamel, green, gray or dark brown, at 200° F. for two hours, or (2) one coat gloss baking japan, baked one hour at 250° F., or (3) one coat air-drying metal primer (bases as above), air dried in 18 to 24 hours, followed by one coat green or maroon color varnish, air dried forty-eight hours. Uprights may be decorated in floral designs at the top with oil or japan colors fortified with varnish, free hand painted. (See Book III.)

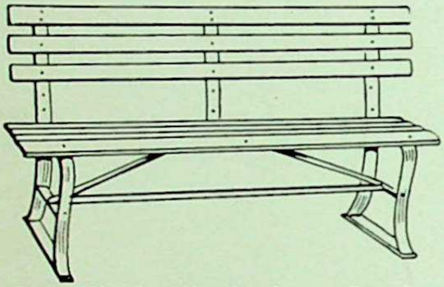


Plate XLIII.—Wooden Lawn Bench, Painted Green with Ready-Mixed Paint.

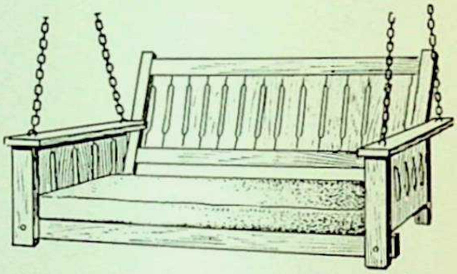
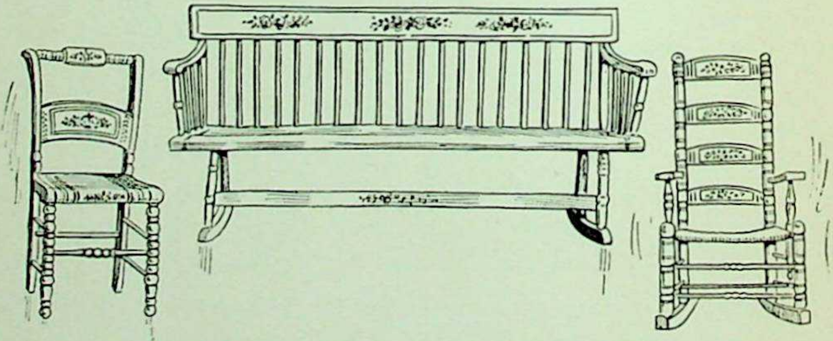


Plate XLIV.—Oak Lawn Swing Finished in Fumed Oak Stain and Coach Varnish.



Hand-Painted Porch Set of Colonial Design.

# CHAPTER XVII

## OFFICE FURNITURE

OFFICE furniture in the main is constructed of oak, walnut or mahogany and comprises desks, chairs, filing cases, hat trees, tables and benches. (For *Metal,* see Chapters IX and X.)

*Oak* is usually first filled with paste filler or combination stain and filler in paste form, shellaced and given two coats of rubbing varnish or lacquer. The shade of the filler is natural or a very light golden color.

*Walnut* is sometimes stained a medium light shade with oil or water stain, followed by a coat of thin shellac, brown or transparent black wood filler, body shellac and two coats rubbing varnish or lacquer.

*Mahogany* is water stained a colonial red color, such as obtained by mixing two ounces standard mahogany red with four ounces standard mahogany brown aniline powder in one gallon water; a water stain is essential as an oil or spirit stain would quickly fade under the strong light to which office furniture is subjected. The stain is followed by a wash coat of shellac, a red or transparent black paste wood filler, a body shellac coat and two coats rubbing varnish or lacquer.

Hat trees, chairs and benches are often finished with two dip coats waterproof coach varnish over the shellac, lightly sanding the first but leaving the second in gloss. Desk panels and filing case parts may also be dipped separately and assembled only when ready for the final varnish or lacquer coat. This top coat, particularly for desks, should be a specially constructed article not too difficult to rub, but of maximum toughness and durability. On desk sides flat varnish over coach is satisfactory.

Period office suites for banks, directors' rooms and consulting rooms are turned out in Adam, Directory, Jacobean and Renaissance styles. When so designed they are finished as above described but stained in colors suitable to the period as outlined in Book I.

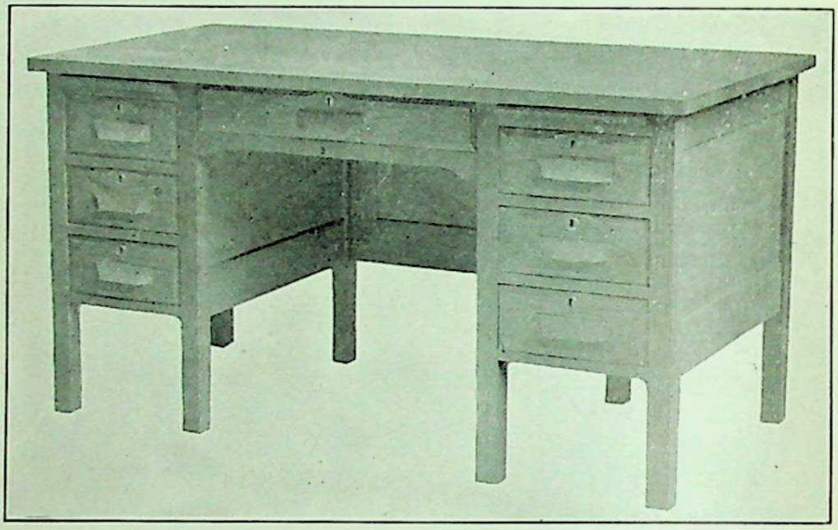


Plate XLV.—Office Desk of Oak, Filled and Finished on the Top with Rubbed Varnish, on the Sides with Flat Varnish.

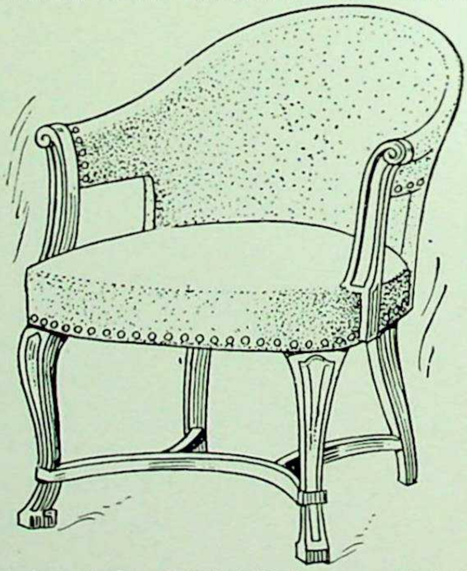


Plate XLVI.—Office Armchair of Solid Mahogany, Upholstered in Leather.

# CHAPTER XVIII

## CHAIRS

THE question of the best finish method for chairs is almost as large as the number of types and designs of chairs. Where made to form a part of dining and bedroom suites, they are finished and decorated to match; for living room purposes they can show all the originality of finish found in novelty and period furniture; for strictly utilitarian purposes, like restaurant, porch and office pieces, they are finished along production lines.

### DINING AND LIVING ROOM CHAIRS

Most "suite" chairs, exclusive of upholstered pieces, are of gum or birch with occasional veneers, overlays and inlays of rarer woods. They must be carefully matched in color, shading, striping, glazing, two-toning, etc., to the suite of which they are to form a part. For details, see Books II and III and Chapters VIII and X (Book V).

Living room chairs are apt to be of period design, upholstered or caned. Some types can be finished by dipping, but most require to be sprayed, including painted designs. (See Chapter XIV.)

### UTILITY CHAIRS

On bentwood and other utilitarian chairs a water stain is impracticable, owing to the expense of sanding down the raised fibres, and it is impossible to make a combination water stain and filler. About the cheapest way to finish a chair made of birch, beech or elm, or all three mixed in indiscriminately, as is often the case, is to dip it in asphaltum varnish thinned one part to three of solvent naphtha, followed by one dip or spray coat of cheap coach varnish. This will give a fair golden oak shade and offer a reasonable resistance to wear, for the price. By thinning the asphaltum varnish somewhat less, the shade of the finish may be made to approach that of walnut.

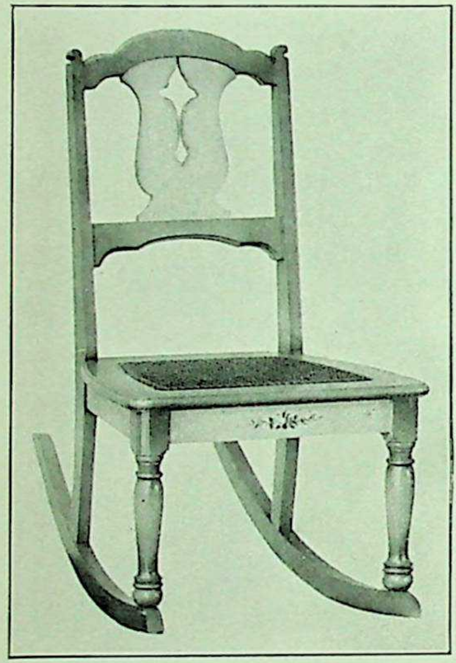


Plate XLVII.—Oil Enameled Bedroom Chair, Spray-Shaded and Hand-Painted.

Plate XLVIII.—Utility Chair of Birch Finished Natural with Two Dip Coats of Coach Varnish

Auditorium, assembly room and folding chairs of maple are finished natural with two dip coats of water and printproof coach varnish, neither sanded or rubbed. For a mahogany finish birch is used, first stained with mahogany water stain, then shellaced, sanded, given one coat varnish firstcoater and finished with one coat flat varnish. All coats are dipped and drained on a rack using a brush only to catch and tip off the drip at the lowest point. (See also Chapters VI, VIII, XIII, XV, XXIII.)

### ENAMEL CHAIRS

Utility enamel chairs for kitchens and restaurants can be turned out presentably with a first coat of cheap paint undercoater, not much finer than the flat paint used on plastered walls, and one coat quick-drying gloss oil enamel. The wood for such chairs is usually a combination of glued sections of hard and soft woods, with the result that the average primer will not have enough thinner to penetrate the former nor enough oil to satisfy the latter. This may be overcome to some extent by priming the soft pieces with linseed oil, prior to coating, or an extra coat of primer.

## CHURCH PEWS

Church and lodge furniture may be stained and filled in the regular manner, but a special varnish or lacquer must be employed which will not print or stick in humid weather, or turn white on contact with water. Pew varnish is a special high gloss article meeting these specifications, and is readily obtainable.

Plate XLIX.—Dining Room Upholstered Side Chair, Frame of Gum, Water-Stained, Lacquered and Rubbed Dull.

# CHAPTER XIX

## DRAWERS AND INTERIORS

THE woods commonly used in drawer and interior construction are such close-pored woods as birch, beech, sycamore and basswood, with cypress and pine for sides. Walnut, cedar and mahogany are used in high grade furniture, sometimes alone, sometimes for drawer bottoms in combination with red gum or one or another of the harder woods above mentioned for the sides. The first essential of a good drawer finish is to seal the wood and render it possible for the housekeeper to dust and clean it readily without in time producing a splotched or dingy interior. It must also be waterproof and free of coloring matter which might come off on clothing. From a production viewpoint it must also be economical in cost, not too difficult to apply and if possible of a tone harmonizing with the exterior stain color.

### CLOSE-PORED WOODS

1. *Shellac.*—One coat of the pure orange article, three to four and one-half pound cut, drys quickly, fills well and gives a fairly agreeable natural lustre without rubbing. However it mars readily on contact with moisture.

2. *Shellac Substitute.*—Usually cheaper than the above and popular chiefly for this reason. A few are waterproof, but most are not; when tinted with alcohol soluble anilines the color will fade and possibly come off on contact with moisture, as spirit colors are partially soluble in water.

3. *Wax.*—Over one coat of shellac or substitute, wax offers a surface easy to keep clean and more agreeable in lustre than either of the above. The wax may be tinted.

4. *Wax.*—Used alone it is a purely temporary proposition. When tinted with color in oil, heat or contact with anything

greasy or oily may soften it and cause the color to come off. If wax alone is applied, the wood must be sanded extra smooth.

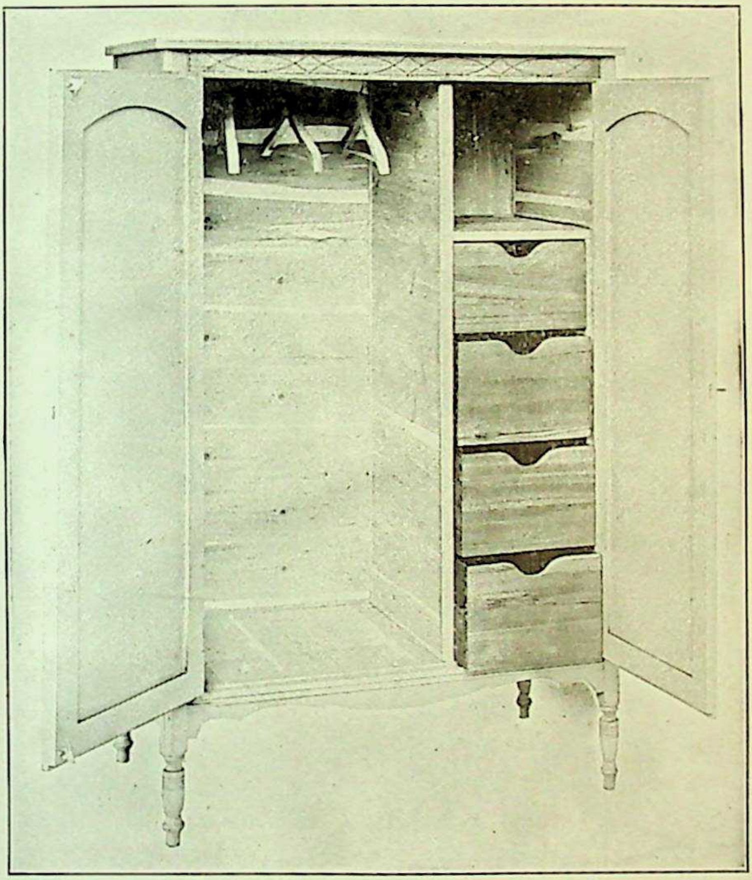


Plate L.—Chifferobe Interior of Cedar—Unfinished in Order not to Seal up Aroma.

5. *Varnish Leavings.*—A slush coat may be made by working over the drippings and skins of varnish with benzine that will answer as a finish on very cheap work. Unless the mixture is well strained it gives a coarse finish with an uneven gloss. An economy job pure and simple best suited to backs.

6. *Flat Varnish.*—Very popular for the better class of furni-

ture, usually applied over a first coat of shellac, substitute, or varnish firstcoater. Possesses much of the merit of wax with none of the drawbacks, though naturally more expensive in cost and slower in drying than any of the above.

7. *Oil.*—This method operates as follows: Apply two thin coats of shellac or substitute; sand and oil off with a rag saturated in paraffin oil. This is quick and inexpensive and gives an agreeable lustre, but is not durable and may be affected by heat.

8. *Drawer Coater.*—There are a number of leading brands most of which are based on one or another of the above. They are waterproof, may be obtained tinted, and vary in cost and speed of drying according to whether on a shellac, substitute or varnish base.

9. *Coach Varnish.*—May be obtained at low cost and makes an excellent undercoat for wax or flat varnish, but alone is not recommended on porous softwoods and does not give an agreeable lustre. It is sometimes tinted a light oak or walnut shade by adding a little asphaltum varnish. One objection, which also applies to varnish leavings, is that hot weather may tend to make it sticky.

10. *Rubbing Varnish.*—When employed as a drawer finish only a light rub is given—just enough to knock off the gloss. An undercoat is required as for flat varnish; for a tinted effect the wood must first be stained or wiped over with filler. This is distinctly a quality method for quality furniture.

11. *Lacquer.*—Excellent over filler on open-pored woods and is waterproof, quick drying and tight sealing, but used alone lacks body and filling qualities and possesses an odor that lingers in closed interiors. Lacquer may be tinted in all wood shades with spirit soluble anilines and at least two coats should be applied, the first lacquer or shellac substitute, the second flat lacquer for its agreeable lustre.

### OPEN-PORED WOODS AND CEDAR

These may be finished the same as above except that paste wood filler of desired shade is required first. Where filler is used no stain need be applied even on high class work as it imparts sufficient coloring in being wiped off. Liquid filler will often serve for thin "wash" veneers on bottoms. Aromatic cedar should be left unfinished.

### COLORING

On cheaper work an orange tone as found in shellac or the amber tone of substitute or varnish is sufficient, except possibly in the case of very white woods like birch. Where stain is used it should be reduced many shades lighter than the exterior, but should harmonize in tone; thinned paste wood filler may be wiped on the wood and then quickly wiped off to give a semi-stained effect at low cost.

### APPLICATION

A well sanded drawer or interior is already half finished. If stained or filled the drawer bottoms may be dipped, dried and then assembled to be finished by spraying. All but lacquer and some substitute shellacs may be successfully applied by brushing as well as spraying and very cheap work can be dipped in varnish, reduced very thin. Varnish on work of any quality, however, should never be applied to the outside edges of drawers as it becomes gummy with heat and causes the drawer to stick. Wax is best for all points of contact between drawer and frame.

# CHAPTER XX

## PICTURE FRAMES

PICTURE frame mouldings come for the most part in long strips already machined or pressed out in a running design by heat. As the woods employed, mostly gum with some bass, are rather soft, the mouldings sometimes reach the finisher already filled to smoothness with white glue primer, as for bathroom mirror frames; if not it is customary to procure a special sealer-surfacer of whiting and glue, to be colored a brick red, for burnishing applied by brush or spray and sanded smooth. Over this there is sprayed a base color coat of bronze powder, pale, rich or Roman gold, mixed in water and glue. Fine lining bronzes are essential for this work, especially as it is customary to burnish the high lights with the agate tool made for the purpose. The whole is then antique or color glazed over a sealer coat of clear lacquer or shellac. Or the moulding may be polychromed, according to whether the design is already pressed in the wood, placed there by raised stippling or else flat stippled. A coat of thin pale lacquer is usually applied over all polychroming for protective purposes. On cheaper frames iridescent Tiffany polychrome effects are procured with distemper colors mixed in a good grade of glue. This dries quickly and requires no clear protective top coating, unless a gloss finish is desired.

Metal leaf may also be applied to the fine grades of picture frames, the gold size, usually japan, being applied over the primer-sealer. Dutch silver leaf (Schlagmetal) may be applied at much less expense than the gold leaf and given a gold appearance by spraying on a coat of gold toning lacquer. It will not tarnish, but should be lightly wiped with beeswax; it should not be burnished.

Imitation leather effects may be procured by spraying a coat of clear lacquer over the primer, followed by black crackle lacquer, then brown lacquer enamel and antique glazing if desired. All sorts of novelty effects are possible—the list is limited only by the selling price and the willingness of the operator to experiment.

# CHAPTER XXI

## CRYSTALIZING

AMONG the strictly modern types of finish, which are the product of laboratory experiment, such as crackle lacquers, is crystalizing varnish. Though of a varnish character and in no sense a nitro-cellulose or oriental lacquer, it is also known to the trade as crystalizing lacquer. Its value with respect to furniture is rather as a decorative medium than as a complete finish, but it has been enthusiastically adopted for camera cases, office appliances, radio horns and fronts, metal novelties, etc., for it is waterproof, tough, and durable, resists oil or gasoline, and is easily kept clean with a damp rag. It may be applied over any kind of hard, non-porous surface, fibre, wood or metal.

The effect is one of myriad softly glowing and scintillating crystals and is obtainable in black for a one-coat job and in clear for a natural (not too pale) or a colored finish over any shade or type of undercoater, enamel, lacquer, japan, shellac or varnish. The clear will reveal plainly any color, decoration, transfers, striping, stencils or even printing underneath, and for a duller lustre or a metallic effect may be coated over with bronze powders mixed in bronzing liquid. As a finish crystalizing is noteworthy in that it will hide surface imperfections, such as scratches, draw marks, etc.

Crystalizing varnish is applied like ordinary varnish, but if brushed, should be applied like lacquer, with as few strokes as possible, without retouching. It is therefore best put on with a spray, in either case away from direct sunlight. The undercoat should be hard dry, for if soft, the finish will fail to crystalize properly. The crystalizing action will take place at room temperatures, but the action is much slower and much more uncertain in results than if artificial means are employed.

These consist of either a baking oven or special air-tight compartment in which the freshly coated objects are placed, not too close together, subject to a heat of 110° F. No light should be admitted and the gas burner or oil stove should operate directly into the chamber, serving both to provide the necessary heat and exhaust the air. The heat should not go over the above temperature and no ventilation should be permitted.

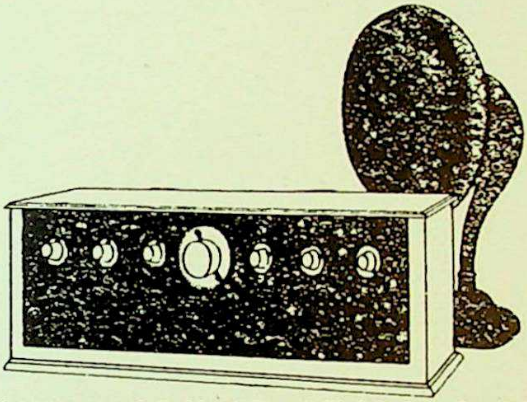


Plate LI.—Radio Horn and Cabinet Panel Finished in Crystallizing Lacquer.

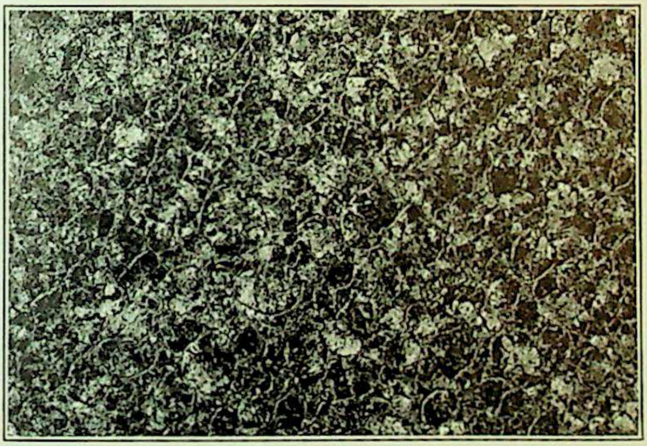


Plate LII.—To be Stippled in on Zinc Etching of Vanity Case, Front of Radio Cabinet and Horn.

The crystals are generally formed complete in from twenty to forty-five minutes. As with crackle lacquer, the depth of film affects the nature of the finish; thus, a heavy coat will yield larger crystals, just as a thin coat will form finer ones. Most of the material is intended to be applied as taken from the container, but may be reduced if desired with naphtha. Once crystalized, the finish may be air dried naturally or baked, one brand of black hardening in two hours at 250° F., the clear at 150° F. in four hours. A higher temperature may be used to

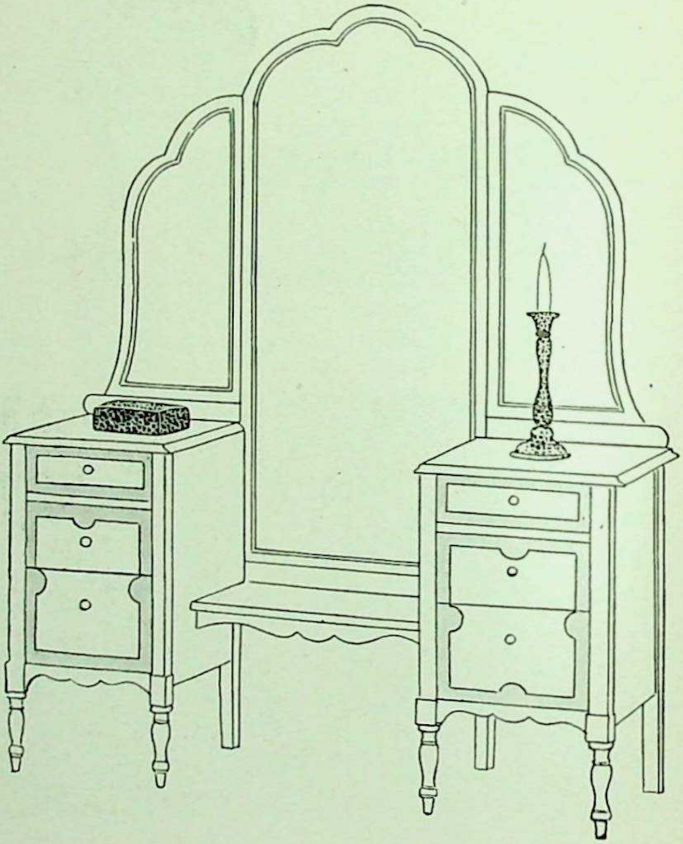


**Plate LIII.—Vanity Case and Novelty Objects Decorated in Crystallized Finish**

shorten the baking time for the black, but the clear may be yellowed with excessive heat.

It should be borne in mind that the two operations of crystalizing and baking are separate and cannot be performed at one and the same time. The baking is the same as for any japan varnish or enamel; the crystalizing is a prior process and does not yield a dried finish. Thus, wooden furniture, for instance, is best air dried after the crystalizing, whereas a metal object may be baked and is therefore more quickly finished.

# CHAPTER XXII

## MIRROR RESILVERING

THE equipment necessary for mirror silvering consists of an inclined washing rack, a movable table on casters and a large solidly-made silvering table. This last is covered with canvas stretched tight over a layer of felt so as to give a firm surface which at the same time will yield enough to prevent breakage of the glass. Underneath the table top, and about equal to it in size, is placed a shallow metal tank, full of water, through which a system of steam pipes is passed back and forth to be kept at a uniform heat.

*Removing the Old Backing.*—The initial operation calls for removing the old paint and silver, the first with paint and varnish remover, the second with nitric acid or a mixture of nitric and sulphuric acid. The latter is rubbed on gently with a ball of cotton batting tied around the end of a stick dipped into the acid. It is then mounted on the wash rack and washed clean with distilled water, after which it is ready for the application of the tin solution.

*The Tin Solution.*—Now mix a solution composed of one ounce of muriate of tin (crystals) to one gallon of distilled water and pour on over the glass. When it has drained down over the entire glass, pour on clear distilled water; it will appear to wash off the tin solution, but actually a sufficient trace will be left. The glass is then moved from the rack to the heated silvering table so that in the next operation it will be warm enough for the silver nitrate solution to precipitate. It is desirable to place small V-shaped wedges under the edges of the mirror in order first, to assure its being exactly level, and secondly, to make the mirror easier to lift off when the silvering has been completed.

*The Sliver Nitrate Solution.*—The next step is to apply the silvering solution, which is composed of two solutions prepared separately, then mixed together in equal parts. All of the chemicals can be secured from a druggist who, on request, will also do the weighing.

*A Solution.*—Dissolve 120 grains of silver nitrate in two fluid ounces of distilled water and pour quickly into a boiling solution of 96 grains rochelle salts mixed in two fluid ounces distilled water. When cool filter through filtering paper into a glass jar, or bottle and make up to twenty-four fluid ounces with distilled water.

*B Solution.*—Dissolve 120 grains of silver nitrate in two fluid ounces of distilled water and add ammonia until the precipitation is nearly completed. Then make up to twenty-four fluid ounces with distilled water and filter into glass container as above described.

*Silvering.*—When the two solutions have been mixed into one, it is poured slowly on the glass so as to cover completely without running off. After being left on the silvering table fifteen to twenty minutes, the mirror will have gradually taken on a uniformly grayish appearance which indicates complete precipitation of the silver. The mirror is now gently tipped to permit the free top layer of water to run off onto the canvas, after which it is carefully placed on the movable table and gently tapped with a chamois skin to remove all remaining moisture.

*Painting.*—When the mirror is completely dry, a coat of thin shellac is applied over the silvering as it has been found that this gives a good foundation for the paint and adds to life of the silver. When this is dry a coat of special mirror backing paint is brushed on. This paint comes in paste form in various shades of gray to be reduced to brushing consistency with benzine or turpentine. It will dry in about twenty minutes, forming a hard, durable finish and may be obtained from a number of manufacturers.

# CHAPTER XXIII

## CANE GLAZING

CANE for furniture comes in two forms, glazed or glossy and unglazed or dull and porous, of which the former is most generally encountered. The purpose is usually one of finishing to harmonize with the furniture color, walnut, mahogany or oak. This may be in a straight color or in a shaded, antique effect. On painted work the same or a shaded effect is customary.

*Glazed.*—The problem with glazed cane is primarily to make the color adhere, for the glossy surface holds out the finish and the uncertain anchorage afforded renders chipping and flaking easily accomplished. Three types of mixture are therefore used as follows:

(1) Dissolve in denatured alcohol equal parts Bismarck brown and spirit black and add an equal amount of white shellac. This will give a dark brown shade suitable for brown mahogany; the proportions of powder may be varied for a more reddish effect and for walnut, loutre brown may be substituted for Bismarck brown. In fact any combination of spirit soluble anilines may be employed to secure the desired shade. If it is desired to high-light, this should be done with a spray.

(2) In a similar way dry colors, such as siennas and umbers, rose pink and Van Dyke brown, may be mixed in turpentine and japan dryer with a little linseed oil added to make it possible to high-light by wiping. Japan colors may also be employed, reducing with turpentine and adding a little boiled oil. These mixtures should be applied thin and may be brushed or sprayed on.

(3) On cheaper work penetrating oil stains may be applied, slightly reduced with benzole to increase penetration, and with

a small amount of japan dryer added to hasten the drying.

*Unglazed.*—Unglazed cane readily absorbs the color and is most easily finished with one or another of the spirit shellac or lacquer shading mixtures described in Book I, Chapter I. Mixtures containing oil are best not used as they may tend to darken the cane excessively. Solid woven cane is of a coarser weave and is used chiefly on porch and utility chairs, being finished with the same varnish as the frame (See Chapter XVIII).

*Protecting.*—To protect the color glazes mentioned, a coat of clear flat lacquer is suitable for all but (3); flat varnish may be, and customarily is, used on all. There is no objection to a gloss lacquer or varnish providing this lustre is satisfactory.

## CHAPTER XXIV

### PIANO FINISHING METHODS

WHEN the piano comes from the cabinet shop, sponge the case with hot water. Let the case dry and sand down with 2/0 garnet finishing paper, using a cork block over the paper. By this method the grain of the wood is raised and sanded off before using water stain, otherwise the water stain will raise the grain too much for a good finishing surface.

*Staining.*—Prepare water red and brown in desired proportions for walnut and mahogany cases, or for golden oak, prepare brown alone. Two parts of red and one part of brown will make a fiery red mahogany stain. One part of red and two parts of brown will make a good Colonial mahogany stain. These proportions may be varied as desired, and nigrosine (black) crystals can be added if a darker shade is desired for any formula. These stains must be prepared in hot water, as outlined in Chapter IV, Book II, except one-fourth pint of corn syrup is added to the stain while hot and thoroughly mixed. Apply this stain while hot with a three-inch brush, being careful to cover the surface thoroughly. Brush out the stain with the grain of the wood and with a stroke the full length of the piece on which you are working. The stain may be wiped to insure a good even coverage, using cloths that will not allow lint to catch in the grain. Allow at least ten hours for drying.

*Wash Coat of Shellac.*—A much better finish is obtained if the stain is covered with a wash coat of shellac and then sanded to cut off the little fibres that are raised by the staining. Prepare one to two inches of four-pound cut shellac in the bottom of a gallon pail and then fill up with alcohol; mix thoroughly and apply quickly and evenly without brushing out. As soon as this coat is dry, which will take four or five hours, sand the surface lightly with 5/0 garnet finishing paper, being careful not to disturb the stain coat. Clean up for filler coat.

*Filler.*—Use a selected filler of a color to match the stain and apply as usual across the grain, brushing in well. When the filler begins to dull, wipe off across the grain with tow, moss, wood wool, or burlap. Finally wipe lightly with the grain, being sure that every portion has been wiped clean, especially in the recesses and corners. The filler should dry in a heated room, at least eighteen hours before applying varnish.

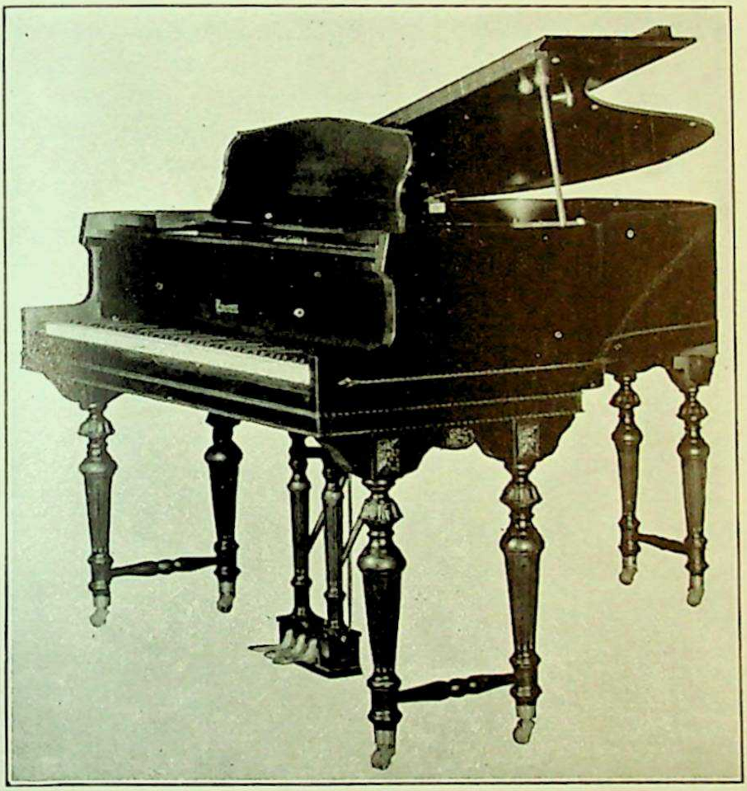


**Plate LIV.—Mahogany Grand Piano, Shaded and Finished in One Coat Gloss and One Coat Flat Lacquer.**

*First Coat.*—The first coat of varnish should be thinned about one-tenth with spirits of turpentine and applied as usual, brushing thoroughly. Finish off each piece with the grain and avoid runs and sags. This coat should be allowed about one week for drying in a heated drying room. When sufficiently hard, sand lightly with 3/0 garnet finishing paper and wipe.

*Second-Third-Fourth Coats.*—The next three coats of varnish should be applied the same as the first, except that the varnish is not thinned, so as to get all the body necessary for good rubbing. Allow at least forty-eight hours for drying between these coats. Ample time for drying will prevent checking later on. Pianos finished by this method have been known to last ten years without checking.

*Coarse Rubbing.*—When the fourth coat is dry, usually in five to ten days (to permit as much shrinkage as possible to take place), rub with FF Italian pumice and water, using woven felt. Keep plenty of water on the surface and merely rub until a fairly level, smooth surface is obtained. Flush off with water and clean up with sponge and chamois.

*Flow Coat.*—There are special varnishes for the finish coat of a piano, known as "skin coats," and they do not need reducing, but if a heavy body varnish is used, it is necessary to reduce it about ten per cent with spirits of turpentine, as for the first coat. Flow this on heavily with little brushing in such a way that the varnish will flow out without brush marks. Pick out dirt specks.

### TO PRODUCE A HIGH POLISH

After the flow coat has dried hard, it can be rubbed with FFF pumice stone and water. This coat should be rubbed to a very smooth surface. Wash off thoroughly and then rub with rottenstone and water, saving the spent rottenstone slush (sometimes known as "suds") in a glass covered with a cloth. This spent slush is used later on for hand-rubbing. The water is used in a pressed felt and rubbed over a brick rottenstone and then rubbed, with the grain, systematically over the surface until polished. Draw the palm over the surface at intervals to ascertain if sufficiently rubbed and ready for hand-polishing. A good practice is to rub with the grain for the pumice rubbing and across the grain for the rottenstone rubbing, thus eliminating the pumice scratches with the rottenstone, finally with the grain.

### HAND POLISHING

Take two pieces of felt, cut 3x5, and one-fourth inch thick, place them together and soak with water and lay in a flat dish containing very little water. Rub rottenstone slush from the glass on the felt. Slap the hands on this felt hard and rub the surface across the grain until the scratches from the rottenstone disappear and then rub with the palm of the hands with the grain until a mirror-like finish is obtained. The hands must be quite damp at first, but almost dry for the finish rubbing. One must have hands free from callous spots to do good polishing and this can be obtained by rubbing the hands on a pumice stone brick with water. The piano is then oiled off with lemon oil polish and then spirited off with a rag dampened with alcohol and wrung out until it will not leave a freezing sensation to the face when applied. It is not safe to apply an alcohol rag to the finish, if this condition can be noticed. Of course it is understood that the oil is first wiped off with a rag, being careful that none of the rottenstone has been left in corners. After cleaning off, the alcohol rag sufficiently dry is used, and the surface is cleaned taking up the oil. It is frequently necessary to use a second alcohol rag in order to be sure all the oil has been removed.

### SATIN FINISH

The flow coat is rubbed with FF pumice stone and water with a woven felt pad. This slush is then cleaned off and dried. Then flood the surface with a mixture of lemon oil polish and benzine and FFF pumice sifted on the surface with a sack or perforated shaker.

One must be careful to get the pumice stone evenly distributed over the surface and have enough oil on the surface to saturate the pumice. This mixture should form a slush on the surface. Wipe this slush off with the grain and continue to wipe dry afterward with clean cloths. This will produce a most beautiful satin finish.

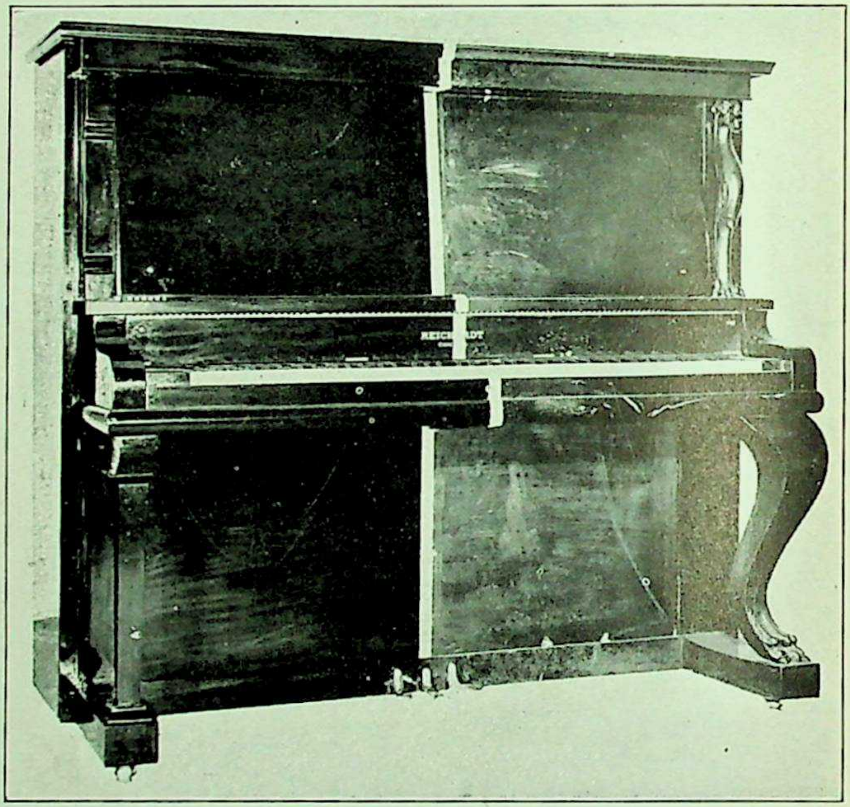


Plate LV.—Varnish Checks Removed by Amalgative Process—One-half of Finish Restored and Made Up-to-Date by Replacing Leg and Pilaster.

Many machines have been designed for rubbing and can be used largely for coarse rubbing and even for fine rubbing where they are handled with accuracy.

Waterproof garnet paper, to some extent, has taken the place of pumice stone for fine rubbing, but piano factories are slow to change a system that has taken years to develop and perfect. Good work can be done with this paper, if properly handled, and it will cut faster than the pumice with a great deal less cleaning off after using.

### ANTIQUE LACQUER FINISH

Water stain of desired shade is first applied, a typical one for *mahogany* consisting of 3 oz. bichromate of potash, 2 oz. jet nigrosene, ½ oz. mahogany brown, 2 oz. lemon yellow and 1 oz. walnut brown to 15 gallons water; for *walnut*, 1¼ oz. walnut brown and ¼ oz. mahogany brown to 2½ gallons water. This is followed by a wash coat of 2 parts 4-lb. cut white shellac to 1 part alcohol, and sanding, after which the method is the same for both woods.

The filler should be a black transparent one, reduced with naphtha to what would be a milk rather than the regular cream consistency as it is not intended to fill the pores flush. After wiping, the filler is allowed to dry 24 hours and is then shaded with the spirit shading stain formula described in Book III, Chapter IX. When dry, the case is finished with two coats medium lustre flat lacquer, applied at 24-hour intervals, the last coat rubbed with a waxed rag in 48 hours. All work is done by spraying.

### BUILT UP LACQUER FINISH

Where a closer approximation of the conventional varnish system is desired, the following schedule is used. The work is stained and filled in the regular way, allowing 24 hours for the water stain to dry and 48 hours for the filler which is applied so as to fill the pores flush with the surface and using a filler constructed to withstand lacquer solvents. This is important. Now apply a coat of high-grade wood lacquer and allow a full 24 hours before applying the second coat. Allow 48 hours before applying the third coat, adding 24 hours to the drying of each successive lacquer coat; from four to seven coats may be applied, according to the depth and fullness of finish desired.

After the final coat of lacquer is on the work, it should be allowed to stand almost a week so that all lacquer solvents will evaporate and all of the shrinkage that is going to take place will have occurred before the lacquer surface is rubbed. After the surface has been rubbed it should be fine-rubbed and polished or fine-rubbed and left dull as desired, without applying further coats of lacquer. All work is done by spraying except filler.

### LACQUER VERSUS VARNISH

A lacquer finish on pianos has been slow to develop and has not yet had claimed for it greater economy or the same qualities of body or lustre as varnish. It has, however, shown remarkable results in point of freedom from the marring, chipping, shrinking and checking troubles so frequently associated in the past with varnish. A lacquer finish is especially recommended where cases are intended for export shipment.

# CHAPTER XXV

## IMITATION BURL WALNUT ON GUM WOOD

STAIN the wood with walnut crystals dissolved in hot water one shade lighter than the surrounding finish for a ground color. Prepare three distemper colors of Van Dyke brown, burnt umber, and drop black, mixed with vinegar (white) to get the correct shade to match the walnut. This mixture should be the consistency of a heavy paste.

Dip a sponge in the vinegar and take enough color in the sponge to cover the surface with one stroke, lapping each stroke until the whole surface is covered evenly.

Prepare a woolen rag (preferably a piece of woolen pants) twenty inches long and from four to ten inches wide, depending on the width of the piece on which you are working. Fold this rag in pleats about one inch wide (the folds can be varied, depending on the size of the figure desired), and then soak it in water and squeeze out until the water will not run out of the rag when handling.

This folded rag must be rolled over the surface lightly and quickly before it is dry. The rag will pick up the color on the folded edges and leave the color between the folds, thus creating a good imitation of burl walnut finish. This of course must be blended out with a camelhair blender, four inches wide, with bristles at least three or four inches long. Blend lightly across the grain figure and then lightly with the grain. This whole operation must be performed with the finish wet.

Let dry about thirty minutes and apply brown colored lacquer or varnish, being careful not to disturb the distemper color, and to avoid this when using varnish, it must be applied quickly. The lacquer can be applied better with an air brush. After this coat is dry, sand lightly and finish with other coats as desired.

# CHAPTER XXVI

## BATIK ON WOOD, GESSO, GILDING, POLYCHROME

### BATIK

SELECT a design you wish to batik and then trace it on the piece you are decorating. This is best done by using a pouncing pad, but if one is accomplished at drawing, the design may be traced on the wood with charcoal. The design is then covered with paraffine wax used in a tool known as the Reinann batik pencil. Other tools may be used, but this one produces the best results.

Use an alcohol lamp to heat the wax, as the wax must always be fluid to flow easily, and apply the wax along the design you have drawn, filling in the part that you wish left in the natural wood. For larger surfaces a brush may be used for applying the wax.

The wax will prevent any stain penetrating this portion, and when the wax is removed, the design is left in the natural wood. Water stain is the best to use for staining the wood after the batik. Many colors of stain can be used by waxing all of the portion except the one you are staining each time you apply stain.

When the stain is dry, the wax is removed with a knife and the remaining wax rubbed into the wood with a woolen rag, thus finishing the wood with a semi-gloss polish.

### GESSO

Gesso work is very fascinating and offers a wide field for design on wood, metal, paper, glass, etc. This work consists of building up a design in raised relief, so that the finish will have the appearance of being carved. This material can be purchased at any art store. First draw your design on the wood, or trace it as you have been instructed above in batiking, and have a fine pencil brush for drawing your design. Always have a glass of water near by to keep your brush clean. In building up the design, keep your brush well filled with gesso and let it flow over the end of the brush. Use your fingers or a piece of wood or bent wire to keep the lines in perfect shape.

More coats of gesso can be applied to build up the design. Your taste alone is your limitation. The beauty of making designs of this kind is that if a mistake is made, the gesso can be removed and done over. After the design has been built up as desired, allow it to stand two hours for drying. You can then paint or stain the article any color you want, and after that you can paint, gild or color the gesso any desired shade, and in some instances the whole piece is sprayed with burnished gold and raised portions burnished with a burnishing tool.

## GILDING

First give the article you wish gilded two coats of shellac. If you are working on metal, be sure that the metal is free from grease. To mix the gold size, thin the gilder's oil with turpentine to about the consistency of water, then mix a little chrome yellow and tint it with vermillion to give the gold size a gold color, running the size through a strainer, adding some varnish or a little japan drier, as experience may teach, so that the size will dry tacky. When applying the size, rub well into the crevices with a stiff bristle brush and let it stand for a minute or two so that the excess oil will run down. Then go over the whole surface with a soft piece of cheese cloth, saturated with gold size. Let it dry over night or about sixteen hours. For faster drying, mix accordingly more japan dryer.

Apply the gold leaf to the parts that are sized and have some cotton waste handy with which to rub the leaf down. With a clean piece of cheese cloth, rub the leaf until smooth. Be sure to rub some beeswax onto the cheese cloth so that the cloth will not scratch the gold leaf.

To get the gold leaf into the crevices, use an ordinary clothes brush, rub some wax on the brush, and in that way you save all of the waste leaf. After the gilding is done, go over the leaf with a thin coat of shellac so that the work will not tarnish and can be colored in antique as desired and explained under polychrome.

Schlagmetal may be used for cheaper work instead of genuine gold leaf.

## POLYCHROME

Polychroming means a combination of colors, and any number of colors may be employed. In polychroming over metallic or bronzed surfaces, japan colors are used for quick drying. Any number of effects may be obtained by mixing metallic bronzes with colored enamels.

For instance, a lampshade is of black silk, gold and coral. You would wish the stand to carry out the same effect, so gold leaf the stand or bronze it, then trim it with coral and black.

In using japan colors, a thin coat of shellac is put on and then a glazed coat over the entire surface. This is done by mixing burnt umber ground in japan, with a small portion of burnt sienna thinned down with turpentine and wiped off as you see fit, using a piece of cheese cloth dampened in turpentine. Then with a soft brush or powder-puff, apply a coat of rotten stone which will adhere to the glazed coat. Then wipe off the extreme high lights. Another way to get an antique effect is to use burnt umber, mix it with turpentine, then stipple a thin coat of this on the work. Let this dry a few hours and use a piece of cheesecloth dampened in benzine, and wipe off in such a way as to obtain a scratchy effect. After this, brush on a thin coat of shellac or spray on a coat of lacquer. Follow this with a glazed coat of white lead, a little black and a little sienna, all ground in japan colors. Thin this down with benzine and brush it all over the surface and wipe off, leaving the glaze in the crevices.

# INDEX

Abrasives, 382
Adam Brothers finish, 81; furniture, 77; decorations, 79
Adulteration of shellac, 154
Air scrubber, 148
Alcohol stains, 425
Alternating filler, 181
Amalgamater in French polishing, 379
Amalgamating the surface, 418
American Colonial furniture, 105; Empire furniture, 111
Aniline spirit stain, 243
Antique dusting, 252; glaze patching, 437; lacquer piano finish, 533
Application of filler, 177; of frosting, 310; of oil stains, 171; of spirit stains, 172; of water stain, 169
Applying liquid filler, 181
Art metal furniture, 484
Art relief, 322
Ash stain, 241
Assyrian furniture, 21
Baked enamel finishes, 439
Banding, striping and vein lining, 293
Basswood, 126
Bathroom furniture, 500
Batik on wood, 536
Belt sanding, 195
Birch, 127; poplar and gum, 239
Bleaching and toning veneers, 287
Bleaching formulas, 232; wood, 232
Blending, 247
Block graining by machine, 478
Breakfast room furniture, 470
Bronze colors, 298; finishes, 462
Bronzed metal furniture, 486
Bronzes, 294
Bronzing, 361
Brown mahogany oil stain, 165; mahogany over red, 228
Brush graining, 477; dulling, 385; shellac, 188; spattering, 317
Brushes for patching, 384; for stripping, 296
Brushing enamel undercoaters, 192; how to learn, 191; shellac or spirit varnish, 187; second coats, 205
Brushing-in enamel or lacquer patching, 431
Building up a spot, 419
Bullet wood, 143
"Burning-in" for scratches, 404; wood cement, 429
Burnishing bronze, 436
Butternut, 138
Candle sticks, 443
Cane glazing, 526
Carved turnings, 445
Carvings and flutings, 252; and mouldings, 268
Cedar, 129; chests, 450
Cement for scratches, 404; wood turners, 380
Chairs, 511; utility, 511
Checks removed, varnish, 229
Chemical stains, 161
Cherry, 130
Chestnut, 130
Chinese Chippendale, 70
Chippendale, English, French, Gothic and Chinese, 70; finish, 72; furniture, 68
Church pews, 513
Classic revival, 96
Cloth shades, crystal or beaded, 446; shades glacé, 446
Cloudy or grayish finishes, 422
Coaters, first, 182; opaque, 182
Colonial furniture, 105; period, post, 111
Colored enamel lacquers, 437

Coloring for carvings, 270
Color and color harmony, 157; modification, 158; schemes, 498; schemes for novelty furniture, 490; shading, 248, 251
Colors for finishing room, 144; for striping, 297
Composition carving, 272
Covering old surfaces, 230
Crack filler, 175
Crackled lacquer, 307
Crackling, 306
Cromwellian furniture, 52
Crystalizing, 520
Dagger stripers, 386
Decalcomania application, 340; designs, 340; transfers, 338
Decoration of novelty furniture, 491
Decorative materials, 124
Dipping stains, 173
Drawers and interiors, 514
Drying qualities of stains, 164; time for first coaters, 193; time for second coaters, 208
Dull finish, 215
Dulling brush, 385; to match finish, 412; sprayed patches, 417; the spot to match, 420
Duncan Phyffe and American Empire furniture, 111
Dusting, antique, 252
Dutch influence, 58, 63
Early Colonial furniture, 105
Egyptian furniture, 21; modern reproductions, 25; finish, 25
Elizabethan furniture, 47
Elm, 131
Empire, French, furniture, 100; furniture, American, 113
Enamel brushing, 207; second coat, 201; rubbing, 220
Enameled chairs, 512; metal furniture, 480; wood furniture, 496
English pear tree, 141
English Renaissance furniture, 47
Equipment for finishing room, 144
Factory procedure, 189
Felt for sanding or rubbing, 384
Filler, 174; application of, 177; as stain, 174; crack, 175; liquid, wood, 179
Fillers, 153
Filling carvings, 179
Finishes, patching special, 435
Finishing coats, 212; materials, 150; paper, how to hold, 198; room, equipment, materials, colors, 144; the spot, 419
First coat materials, 153
First coaters, choice of, 182
Flat base, 302
Flat coat materials, 221; frosting, 312
Flutings, 252
Formulas, bleaching, 232; for aniline spirit stain, 243; for filler, 180; for gesso, 320; for mahogany stain, 239; for mirror resilvering, 525; for paint stipple paste, 320; for stains, 165; for walnut water stain, 237; stain, for veneers, 290
Free-hand painting on furniture, 345
French Empire furniture, 100
French polishing method in graining, 434; polishing on water spots, 422; polishing, rules for, 391; varnish, 378
Frenching packing marks, 389; using a rubber for, 390
Frets, 279
Frosting, 309
Furniture decoration, 235; finishing, 121; finishing, history of, 121; patching, 369
Georgian period, 73, 77, 82; furniture, 68
Gesso, 300, 320, 536
Gilding, 537
Glazing and shading painted work, 245; cane, 526; free-hand painting, 348
Gold bronze finishes, 435
Golden oak oil stain, 165
Gothic furniture, 30; modern reproductions, 34
Graeco-Roman furniture, 26
Grain defects in patching, 434

Grained metal furniture, 475
Grayish finishes, 422
Greek furniture, 26
Greening, to avoid, 287
Grilles, 279
Gum, 132; adulteration, 155
Hand polishing for piano, 531
Hand-sanding first coats, 196
Hand stippling, 256, 322
Hepplewhite designs, 75; finish, 76; furniture, 73
High-lighting and blending, 247; by wiping or sanding, 242; stained work, 235
High polish for piano, 530
High-polished surfaces, 218
Imitation burl walnut on gum wood, 535
Imitations, metal leaf, bronze and metallic, 358
Indentations and rubbed through places, 413
Ink stains removed, 424
Inlay and marquetry, 274
Italian Renaissance furniture, 35
Jacobean finish, 57; furniture, 52;
Jesso, 300, 320, 536
Juvenile furniture, 499
Kitchen cabinets, 454; furniture, 500
Knife, patching, 383
Koa wood, 143
Lacquer, crackled, 307; enamel, 266, 353, 456, 497; enamel coat, 201; enamel on fibre and willow, 461; enamel spraying, 203; enamel system, 483; finish for pianos, 533; finish, transparent, rule for, 184; formulas, unbalanced, 423; graining system, 479; material, brushing, 206; material, rubbing, 209; materials, 123; oriental and modern, 350; over lacquer, 200; over shellac, 199; rubbing, 220; spraying, 203; stippling, 325; undercoater, 193; veiling, 317
Lacquers, grades of, 124; test of, 156; thinner for, 156
Lamp bases, 443; shades, 446; stands, metal, 448
Late Colonial furniture, 107
Liquid wood filler, 179
Louis XIV furniture, 87
Louis XV finish, 95; furniture, 91
Louis XVI finish, 98; furniture, 96
Magnolia burl, 142
Mahogany, 133; water stain, 239
Maple, 137; stain formula, 239
Marquetry, 274, 277
Matched veneers, 285
Matching colors in patching, 427
Materials for finishing room, 144; for pigment glaze, 245; for patching, 376
Metal exteriors, 456; furniture, grained, 475; interiors, 454; lamp stands, 448; leaf, bronze and metallic imitations, 358; leaf imitations, 358; leaf patching, 436; outdoor furniture, 508
Metallic imitations, 364
Middle Colonial furniture, 107
Mirror resilvering, 524
Mission furniture, 46, 115
Mixing stains, 167
Modern Chippendale, 72
Modern Louis XIV furniture, 90
Mouldings, 268; composition furniture, 271
Multicolor blend, 304
Naphtha, use of, 164
Napoleonic period, 100
Natural filler, 176
Nitro-cellulose lacquers, 123
Novelty furniture, 488
Oak stain, 241; white, 135
Office furniture, 509
Oil and pumice stone rubbing, 211; and water extractor, 148; aniline, 165; early use of, 122; enamel, 455; enamel for frosting, 461; enamel on fibre and willow, 461; polishing with rotten stone, 218; stain shading, 241; stains, 152; stains applications of, 171; varnish, first coat, 183; varnish over oil varnish, 200
Opaque coaters, 182
Oriental decorations, 354; lacquering, 350

Outdoor furniture, 504
Outline stencils, 329
Overlapping spray coat, 204
Overlays, frets and grilles, 279
Oxidized copper, 364
Packing marks, removing, 388
Paint and lacquer enamel, 488; or lacquer enamel for two-tone work, 266
Painted veneer, 292; wood, 254
Painting furniture, free-hand, 345
Parchment shades, 446
Patch work kit, 375
Patching furniture, 369; materials, 376; operations for indentations, 415; scratches, 398; special finishes, 435; stains, 381
Perfume and alcohol stains, 425
Piano finishing methods, 528
Picture frames, 518
Pigment colors, 299; lacquer, 427; oil stain, 244; stains, 161
Pigmented wax treatment, 254
Pigments and bronzes, 294
Pneumatic rubbing and sanding machines, 151
Polishing cement in scratches, 408
Polychrome, 300, 538
Polychromed metal furniture, 487
Post Colonial period, 111
Preparing damaged spot for patching, 429
Pumice stone rubbing, 211
Queen Anne finish, 67; furniture, 63
Radio cabinets, 464
Raised designs, 355; stippling and gesso, 320
Red Alder, 126
Red mahogany oil stain, 165
Refinishing, 223, 226
Refrigerators and kitchen cabinets, 454
Regal period furniture, 87
Removing packing marks, 388; varnish and refinishing, 223; water marks on finish, 421
Renaissance furniture, English, 47; furniture, Italian, 35; furniture, Spanish, 41
Repairing deep scratches, 403; enamel and pigment lacquer, 427
Resilvering, mirror, 524
Restoration furniture, 52
Rococo period, 91
Roman furniture, 26
Rosewood, 140
Rotten stone, use of, 218
Rubbed through places, 416
Rubber for patching, 382
Rubbing enamel and lacquer, 220; equipment, 149; machine, pneumatic, 151; varnish finish coats, 214; varnish for dull finish, 215; varnishes, 156
Rules for lacquer finish, 184
Sanding, 418; belt, 195; hand, 196; machine, pneumatic, 151; with water and spirit stain, 242
Satin finish, 216; finish for piano, 531
Satinwood, 140; stain, 240
School furniture, 501
Scratches, light, 398; patching, 398; repairing deep, 403; spraying, 401
Second coat materials, 199; materials, selection of, 199
Second coats, brushing, 205
Shades for piano and bridge lamps, 447
Shading and decorating radio cabinets, 469; methods, 244; on frame work, 241; over filler, shellac and lacquer, 243; painted work, 245; stained work, 235
Shellac brush, 188; brushing, 187; first coat, 183; or substitutes, 212; pure, 153; spraying, 185, 202; substitute, 153; test for adulteration, 154; turning white, 188
Sheraton finish, 86; furniture, 82
Sheraton's "Cabinet Maker and Upholsterers Drawing Book", 84
Silk screen stencil, 330
Silver gray oak filler, 176; gray stain, 240
Smoker stands, 443
Snakewood, 142
Solvents for stain, 162
Spanish Renaissance furniture, 41

Spattering and veiling, 314
Special finishes, 443
Spirit stains, 152; stains, application of, 172; varnish brushing, 187
Spray and brush methods of application, 184; a patch, how to, 394; guns, 147; application of second coat materials, 201
Spray patching outfit, 372; shading, 236; spattering, 314; stippling, 257, 322
Spraying, 246; cabinets, 146; enamel and undercoaters, 204; equipment, 145; lacquer, 200, 246; nitro-cellulose lacquers, 203; oil varnishes, 204; opaque first coaters, 191; outfit, portable, 150; packing marks, 393; rubbed through spots, 417; shellac, 202; shellac or substitutes, 185; spots, methods of, 396; stain, 160, 246; wicker furniture, 222
Stain colors for fancy veneers, 289; formulas, 165; formulas for veneers, 290; for two-toning, 264; on veneer, 292; solvents, 162
Staining carvings and recesses, 170; cement in scratches, 409; fibre reed, 459; over old surfaces, 231; the spot, 419; willow reed, 460
Stains, 159; chemical, 161; for patching, 381; mixing, 167; pigment, 161; selection of, 159; use of water, 167
Stencil color harmony, 334; designs, 334; work, 333
Stenciling procedure, 332
Stencils, 492; and stenciling, 328; types of, 328
Stipple glazing, 261; glazing and Venetian work, 256
Stippled base, 301; finishes, 438
Stippling, spray, 257; hand, 256; methods, 257; raised, 320
Strength of stains, testing for, 152
Striping and lining, 293
Stuart furniture, 52
Substitutes for shellac, 212
Surfaces, covering old, 230
Surfacing enamel or varnish coats, 211; first coats, 194; methods, 408; packing marks, 389; second coaters, 209
Swan quills, 386
Swiss pear tree, 141
Testing filler, 176; for strength of stains, 152; material for color, 430
Thinner for lacquers, 156
Tinting lacquer enamel, 428
Tudor and Elizabethan furniture, 47
Turned objects, 443
Turpentine, discovery of, 122
Two-toning, 264; and shading, 463
Undercoater lacquer, 193
Upholstered furniture, 493
Varnish checks removed, 229; finish coats and rubbing, 214; finish, rule for, 183; or enamel brushing, 207; or lacquer over shellac, 199; removing, 223
Varnishes, rubbing, 156
Veiling, 314; lacquer, 317
Vein or scratch lining, 297
Veneered chests, 452
Veneers, matched, 285
Venetian work, 256, 262
Vernis Martin finish, 363
Victorian and Mission furniture, 115
Walnut, 138; imitation burl, on gum wood, 535; oil stain, 165; panels, 237
Water marks on finish, how to remove, 421; rubbing with rotten stone, 219; stain, application of, 169; stain on panels, 237; stains, use of, 167
White oak, 135
White pore filler, 176
Wicker furniture, 459; furniture, spraying, 222
William and Mary finish, 62; furniture, 58
Willow reed, staining, 460
Wiping filler and drying, 179; with oil stain, 242
Wood exteriors, 457
Woods, 126; close grained, 253; open grained, 252

US PATENT & TRADEMARK OFFICE
3 0402 00119 3509